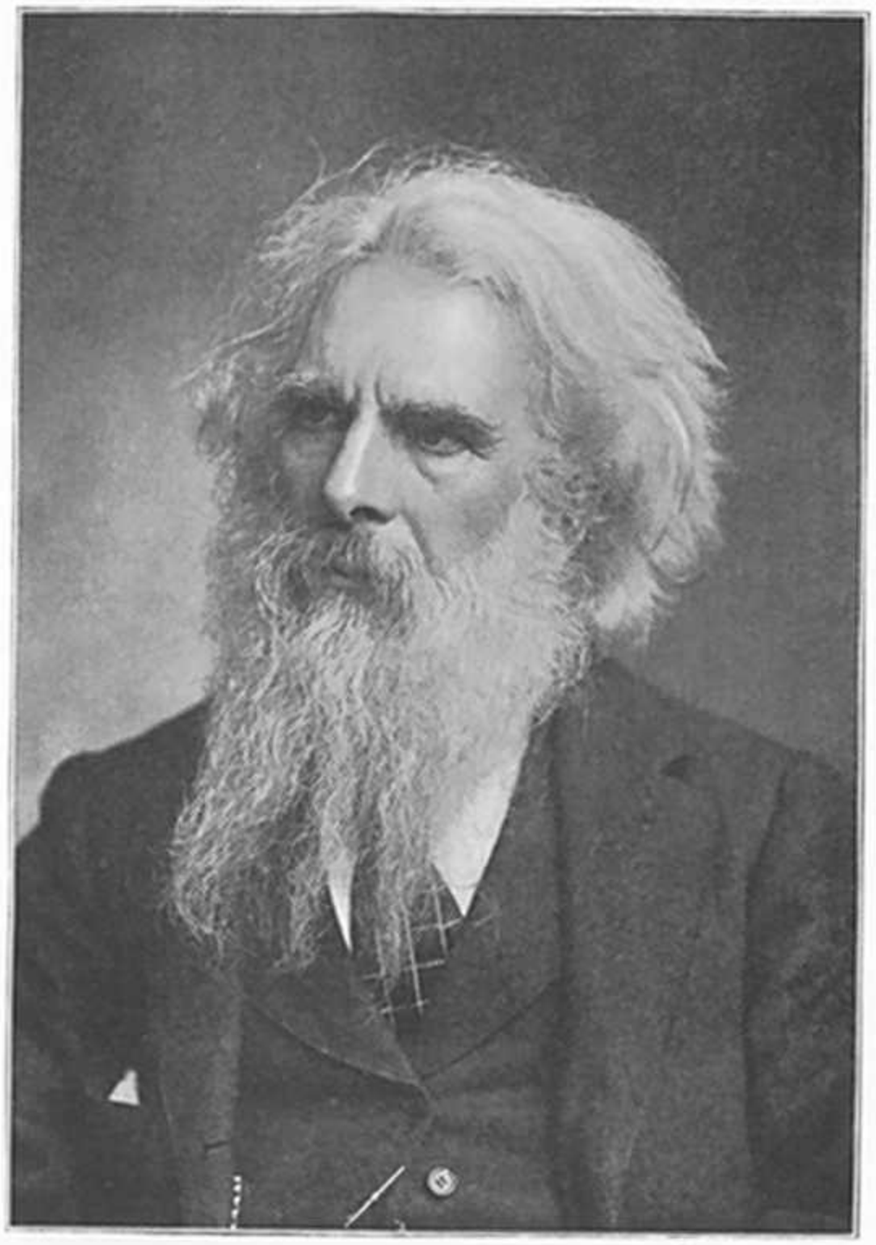
VISIT…

THE HUMAN FIGURE IN MOTION



Edward Humphrey

THE

HUMAN FIGURE IN MOTION . . .

An Electro-Photographic Investigation of Consecutive Phases of Muscular Actions . . . . . .

BY

EADWEARD MUYBRIDGE

(THIRD IMPRESSION)

Commenced 1872. *Completed 1885*

LONDON: CHAPMAN & HALL, LD.

. . . 1907 . . .

INTRODUCTORY.

In the "Transactions of the Royal Institution of Great Britain," of date March 13, 1882, is printed an epitome of a lecture, given by the author of the present work, on the Science of Animal Locomotion in its relation to Design in Art, which is thus alluded to in an article by the late George A. Sala, published in the *Illustrated London News*, on the 18th of the same month—

"On Monday last, in the theatre of the Royal Institution, a select and representative audience assembled to witness a series of most interesting demonstrations of animal locomotion, given by Mr. Muybridge . . . who exhibited a large number of photographs [illustrating consecutive phases in the motion] of the horse, walking, ambling, galloping, and leaping. . . . By the aid of an astonishing apparatus called a zoöpraxiscope, which the lecturer described as an improvement on the old zoetrope . . . the animals suddenly became mobile and beautiful, and walked, cantered, ambled, galloped, and leaped over hurdles in the field of vision in a perfectly natural and life-like manner. . . .

"After the horses, dogs, oxen, wild bulls, and deer, were shown under analogous conditions of varied movement, and finally man appeared (in instantaneous photography) on the screen, and walked, ran, leaped and turned back-somersaults to admiration. . . .

"On the following Thursday Mr. Muybridge repeated his demonstrations at the Royal Academy of Arts."

The transparent photographs used during these lectures were some of the results of an investigation commenced by the author at Sacramento, California, in May, 1872, and continued, with numerous periods of intermission, at Palo Alto, in the same State, until 1879.

The zoöpraxiscope was devised by the author, on the principle initiated in the early part of the nineteenth century by the Belgian physicist Plateau—for the purpose of demonstrating the persistency of vision—and is briefly described in an essay by the late Professor Richard A. Proctor, "Photographs of a Galloping Horse," printed in the *Gentleman's Magazine* for December, 1881. A detailed description of the apparatus is given in a recent work by the author, "Animals in Motion" (Chapman & Hall, Limited, 1898). It will, therefore, be unnecessary

in this place, to repeat what is there said in regard to its construction. It may, however, as a matter of record, be admissible to say that, as photographic analyses of changes incidental to motion of any kind commenced with this investigation by the author, so was the zoöpraxiscope the first instrument ever constructed or devised for demonstrating, by synthetical reconstruction, movements originally photographed from life, and for many years it was the only apparatus in use for that purpose. In the progress of physical science and mechanical construction it has, as might naturally be supposed, had to relinquish to its younger rivals its former unique position; but it was not until 1893, or more than thirteen years after it was first used, that any improvement in its construction or in its effects on the screen were made public. The improvements in the modern instruments are due to the invention of celluloid, as a substitute for glass, for receiving and exhibiting the photographic images.

At the present day, when the many and important chemical discoveries and new appliances enable any youth of ordinary intelligence, by the expenditure of a few shillings and a little attention to printed instructions, to become an amateur photographer, it is not easy to realize the difficulties which had to be surmounted—even so late as twenty years ago—in the production of a satisfactory photograph of a rapidly moving object, which, the writer of the essay in the *Gentleman's Magazine* before mentioned, states he "was assured by one of the ablest English photographers was absolutely outside the bounds of possibility;" it may not be out of place, therefore, to reprint a few paragraphs on the subject, written by the editor of *Knowledge* (London), which appeared in that journal April 14, 1882.

"A few years ago the news of the successful photographing of a galloping horse was received with incredulity. . . . That a horse rushing along at the rate of a mile in one and two-thirds of a minute [more than seventeen yards in a second], and moving its limbs forward in part of each stride with nearly twice that velocity, should be seized by photographic art so as to show every limb well and clearly delineated, would have seemed wonderful indeed to the early professors of that art. Still more amazing is it to find ten or twelve distinct pictures taken during a single stride, the comparison of which, *inter se*, enable the most rapid of all equine movements to be analyzed as though the horse could be made to go through all the motions of the swiftest gallop at a funeral pace. Then, by combining them in a much-improved kind of zoetrope—the zoöpraxiscope—the horse can be made to go through the action as perfectly as though he were actually galloping before the eyes of the audience. . . . This has been done for the horse, and other animals, athletes, gymnasts, and even for birds.

"Not only the characteristic movements of the different actions, but even those slight and scarce definable peculiarities which distinguish the movements of one athlete from another in performing the same feat, of one horse from another in moving at the same gait, and so forth, are perfectly recognizable in the combination of pictures which, separately seen, simply startle us by the new light which they throw on the real nature of these rapid movements."

In confirmation of those "slight and scarcely definable peculiarities" recognized by the editor of *Knowledge* in the synthetic realizations of the zoöpraxiscope, the author will not readily forget the complete refutation of an assertion made by him the first time the apparatus was put into practical operation. The anecdote may not be without

interest, especially to the constructors of the many different instruments which, at the present day, have taken the place of their prototype.

Upon the completion of a series of twenty-four consecutive phases, illustrating a single stride of a noted horse from the stables of Governor (afterwards Senator) Stanford, that gentleman, one evening in the autumn of 1879, invited a few friends to witness, by projection with the oxy-hydrogen light and the zoöpraxiscope, the primitive synthetical reproduction of an animal's movement. "There, Governor," said the author, as he put the apparatus in motion, "you have a representation of Hawthorn galloping at a one forty-two gait," that horse being one of several with which he had experimented. After a few seconds' attention, his host exclaimed, "I think you must make a mistake in the name of the animal; that is certainly not the gait of Hawthorn, but that of Anderson," another horse on the Palo Alto ranch. The author disputed this correction, and reasserted the accuracy of the entry in his record-book. The Governor was equally positive of its error. Upon reference, the next day, to the trainer, the author was informed, very much to his surprise, that the horse sent to him for that particular experiment (without the knowledge of its owner), was Anderson; and at the moment he felt more disappointed at the inaccuracy of his registry than gratified with the perfect manner in which the zoöpraxiscope had performed its duties.

In 1878 the author published, under the general title of "The Horse in Motion," some of the results of his labours in a few sheets of photographs, each one of which illustrated several consecutive phases of a horse while trotting, galloping, and so forth, which were duly deposited, the same year, in the Library of Congress at Washington. Some of these photographs quickly found their way to various parts of the world, and were commented upon by numerous journals of the day. References to a few early reviews of these demonstrations may be found in the Appendix.

The publications of 1878 were followed, in 1881, by a quarto volume of some two hundred pages of photographs, illustrating various movements by horses, dogs, and other animals, and feats of the gymnasium and the field by some Californian athletes.

The favour with which these demonstrations were received convinced the author that a more comprehensive investigation, carried out in a more exacting and systematic manner than was at that time possible at Palo Alto, and with the advantages offered by the then newly discovered dry-plate process, would result in throwing much additional light on the hitherto little known but important problem of animal movements. This new enterprise—if conducted on the contemplated scale—promised to involve such a large expenditure, that some little time elapsed before the necessary arrangements for its execution could be made.

The author was, however, fortunate enough to obtain the co-operation of the University of Pennsylvania, then under the able administration of the late Dr. William Pepper, and was instructed by the trustees of that

institution to continue his researches under its auspices. The work was recommenced in the summer of 1884, and completed in the autumn of the following year.

The system adopted and the apparatus employed differed in no material respect from that used in California, which, having been fully described in "Animals in Motion," it will here be only necessary to say, that by means of three batteries of cameras electrically operated by a motor-clock, twenty-four successive photographic exposures could be made in a quarter of a second of time; and twelve successive exposures, simultaneously made from each of three different points of view could be completed in the one-fifth of a second. The time-intervals between each consecutive exposure of a series were recorded by a chronograph, in one-thousandths of a second, and are, with a few exceptions, reprinted under each series of illustrations.

The results of this investigation—consisting of 781 photo-mezzotint engravings, with examples of more than twenty thousand acts of motion by animals, birds, and human beings—were, in 1887, published in eleven folio volumes, under the title of "Animal Locomotion." Copies of the work were secured by the principal libraries and institutions of science and of art in Europe and America, where they may be consulted by those interested in the subject. Selections of the engravings were also issued in portfolios, and some hundreds of such selections were subscribed for their individual use by artists, scientists, and others on both sides of the Atlantic. In the Appendix may be seen a few facsimile autographs, selected—not without difficulty—from the subscription list of the author, who avails himself of this opportunity to express his sincere thanks to the many distinguished men who thus endorsed the value of his labours.

It being so universally recognized that a study of the precise functions of the limbs, whether of man or of the lower animals, as made known by photography, is of great importance to the physiologist, and to the natural scientist generally; and that a knowledge of the successive appearances which those limbs assume while executing any specific movement is of absolute necessity to the artist, that he may obtain a correct impression of that movement as a whole, and be thus enabled to give a satisfactory and truthful interpretation of it;—it has been decided to republish a number of the most generally useful seriates in a more convenient and popular manner than was adopted in the publication of the original work, in the hope of thus more widely disseminating a knowledge of the facts revealed by the author's researches.

With this object in view, a number of movements of horses and other quadrupeds and birds have, as previously stated, been already republished with the title of "Animals in Motion." The present volume, as its title implies, is devoted exclusively to the human figure.

With regard to the models, the greater number of men were students or graduates of the University of Pennsylvania, each one of whom had a well-earned record in the particular feat selected for illustration. Model 46 was the professor of physical culture; 37, the champion runner, and a good jumper; 69, the best all-round cricketer,

and 30 was equally noted in the game of base-ball. 52, 64, 65, 66, and 67 were instructors at the Fencing and Sparring Club; and 22 was a well-known pugilist. The mechanics were experts in their particular trades, and the labourers were accustomed to the work they are represented doing.

Of the women, 5, 7, 8, 9, 10, and 13 were artists' models, and 12 was a *première danseuse* from one of the Philadelphian theatres.

In addition to the engravings which illustrate successive phases of a continuous or of a completed action, it was thought desirable, in consideration of the small dimensions of the figures, to select some of the phases and re-engrave them the same size as that in which they were originally published. For this selection, and for the omission of many phases necessary to properly illustrate the continuity of an action, the author disclaims all responsibility.

In his examination of the contents of this volume the critical observer will do well to remember that the negatives from which the photo-mezzotints are copied were made more than fifteen years ago; they are reproduced without the slightest attempt being made to improve them; and are presented with all their faults, precisely as taken in the camera.

It cannot be too forcibly impressed on the mind of the student, that the photographed phases of motion in either of the volumes, are not intended for use as a substitute for personal observation. Their value consists, not as individual photographs made at particular instants in the performance of some muscular act—which any one with a hand camera could do equally as well—but as seriates of phases, demonstrating the various changes which take place in the disposition of the limbs and body during the evolution of some act of motion from its inception to its completion. Studied in this manner, the author is not without hope that the artist will realize a just appreciation of the movement itself, and be enabled to give expression to it in an acceptable and at the same time truthful manner.

CATALOGUE OF ILLUSTRATIONS.

THE consecutive phases of nearly all the serial illustrations of movement were synchronously photographed from each of two or from three points of view. Wherever convenient, the foreshortened phases are placed immediately under the corresponding phases of the lateral series. In some of the seriates, two lines of figures are required for the laterals, and one line only for the foreshortenings; in this event the corresponding phases can be readily ascertained by counting the figures.

In all the seriates the sequence of phases is indicated by an arrow.

The classification of the figures into laterals, front-foreshortenings, and rear-foreshortenings, is, in some of the seriates, purely arbitrary. These designations are usually given to the first phase from each of the respective points of view.

The intervals of time between the successive phases—when the chronograph was used—are recorded, under each series, in thousandths of a second. If it is required to ascertain the time in which the complete movement, or any portion of a movement, was effected, it will be merely necessary to multiply the number of thousandths of a second by the number of intervals. For nearly all purposes, however, the calculation of intervals in hundredths, or perhaps even tenths, of a second may be found sufficiently accurate.

As a general rule, the points of view of each lateral series were at an elevation of about one-half the height of the model while standing on the ground. In seriates 1 and 4, the lateral points of view were on a level with the platform on which the model was walking, and so also with the larger figures of the same action as series 1. The points of view of the foreshortened series were—when at an angle of 90° to the laterals—of varying heights of a vertical line; either ascending or descending 3 inches for each successive exposure.

The points of view from other angles were usually on one horizontal line, and about the level of the lateral serials.

The lines on the background were 5 centimetres, or about 2 inches, apart, with broader lines 50 centimetres, or about 20 inches, apart. The usual distance of the model from the background was, for the laterals, about 75 centimetres (30 inches); the distance of the model from the lateral camera usually approximated 15 metres, or nearly 50 feet.

MEN (NUDE OR SLIGHTLY DRAPED).

Series.	Model.	Action.	Number of Figures.			Total.	Page.
			Laterals.	Foreshortenings.			
				Front.	Rear.		
1	46	Walking, ordinary speed	7	—	7	14	17
2	46	„ rapid speed ...	—	9	9	18	19
3	46	„ carrying a boulder on shoulder	9	9	9	27	21
4	46	„ carrying a weight in one hand ...	12	—	12	24	23
5	36	„ up an incline ...	12	12	12	36	25
6	36	„ up stairs ...	11	11	11	33	27
7	36	„ down stairs ...	12	12	12	36	29
8	60	„ and turning round ...	12	12	12	36	31
9	37	Running—the start ...	12	12	—	24	33
10	37	„ a half-mile gait	10	10	—	20	35
11	55	„ full speed ...	—	7	7	14	37
12	26	„ and picking up a ball ...	8	—	8	16	39
13	37	Jumping, standing, broad	12	12	—	24	41
14	40	„ standing, high	12	—	12	24	43
15	37	„ straight, high	12	—	12	24	45
16	37	„ running straight, high ...	12	12	—	24	47
17	37	„ running, twist	10	—	10	20	49
18	27 and 28	Jumping, leap-frog ...	10	9	—	19	51
19	33	Back somersault ...	10	10	—	20	53
20	30	Baseball, catching (error)	10	—	10	20	55
21	30	„ catching and throwing ...	8	—	8	16	57
22	69	Cricket, bowling ...	—	8	8	16	59
23	69	„ bowling over-arm ...	—	8	8	16	61
24	46	Heaving a boulder ...	10	—	10	20	63
25	52	Lifting and heaving a boulder	9	9	9	27	65
26	30	Baseball, batting ...	6	6	—	12	67
27	69	Cricket, batting ...	—	9	9	18	69
28	69	„ „ ...	—	8	8	16	71
29	68	Rowing (machine) ...	12	12	12	36	73
30	46 and 68	Wrestling	24	—	—	24	75
31	66 and 67	Fencing	24	—	—	24	77
32	22	Striking a blow ...	12	—	—	12	79
33	64 and 65	Boxing	24	—	—	24	81
34	64 and 65	„	16	8	8	32	83
35	52 and 53	„	24	12	12	48	85
36	52 and 53	„	24	12	12	48	87
37	59 and 61	Blacksmithing	24	—	—	24	89
38	41	Shovelling	7	7	7	21	91

Women (Nude).

Series.	Model.	Action.	Number of Figures.			Total.	Page.
			Laterals.	Fore-shortenings. Front.	Fore-shortenings. Rear.		
39	6	Walking	12	12	—	24	93
40	7	,, on step-stones	10	10	10	30	95
41	7	,, turning and ascending stairs	12	12	—	24	97
42	7	Turning and ascending stairs with a bucket of water	11	11	11	33	99
43	4	Turning and ascending stairs with two buckets of water	12	12	12	36	101
44	7	Walking down an incline	12	12	—	24	103
45	13	,, down stairs ...	11	11	11	33	105
46	13	Kicking a hat	9	9	9	27	107
47	13	Removing mantle ...	9	9	9	27	109
48	9 and 10	,, water-jar from shoulder to ground ...	22	22	22	66	111
49	8	Stooping and feeding a dog	9	9	9	27	113
50	8	Bathing	8	8	8	24	115
51	1 and 8	A shock to the nerves...	14	14	14	42	117
52	7	Various movements ...	9	9	9	27	119

Women (Half-clad).

53	12	Running with skipping-rope	12	12	12	36	121
54	12	Jumping from step-stones	10	10	10	30	123
55	12	Ricochetting on one foot	8	8	8	24	125
56	12	Sitting down on the ground	10	10	10	30	127
57	12	Getting up from the ground	9	9	9	27	129
58	12	Carrying jar of water up stairs...	12	12	12	36	131

Women (Diaphanous Garments).

59	8	Walking, and flirting a fan	12	12	12	36	133
60	7	Running	—	12	12	24	135
61	8	Stooping, and putting on a shawl	10	10	10	30	137
62	12	Dancing—a pirouette	12	—	—	36	139
63	12		—	12	—		141
64	12		—	—	12		143
65	12	Turning, and raising hands	8	8	8	24	145
66	8	Walking, turning, and ascending stairs	9	9	9	27	147
67	8	,, down stairs, and turning	12	12	12	36	149
68	12	Sitting down on a chair	8	8	8	24	151
69	7	Turning round (semi-recumbent)	7	7	7	21	153
70	12	A high step and a jump	10	10	10	30	155
71	7	Getting on and off a table	10	10	10	30	157

Women (Draped).

Series.	Model.	Action.	Number of Figures.			Total.	Page.
			Laterals.	Foreshortenings. Front.	Foreshortenings. Rear.		
72	7	Carrying a basket on head, and turning ...	12	12	12	36	159
73	7	Emptying a basin of water	10	10	10	30	161
74	7	Lifting and carrying a basket	9	9	9	27	163
75	5	Walking and stooping ...	12	12	—	24	165
76	5	,, adjusting train, and turning	12	—	12	24	167
77	15	,, down stairs, a lamp in hand ...	12	—	—	12	169
78	15	Lawn-tennis	8	8	8	24	171

Women and Children.

79	12 and 70	Child greeting a stranger	24	—	—	24	173
80	12 and 70	,, being lifted from the ground	24	24	24	72	175
81	12 and 70	Child being placed on the ground	18	18	18	54	177
82	12 and 70	Running	16	16	16	48	179

Children.

Series.	Model.	Action.	Number of Figures.			Total.	Page.
			Laterals.	Foreshortenings. Front.	Foreshortenings. Rear.		
83	70	Crawling on the ground	12	12	12	36	181
84	72	Walking	11	—	11	22	183
85	70	Running	12	—	—	12	185
86	70	Crawling up stairs ...	8	—	8	16	187
87	70	Attempting to walk up stairs	12	—	12	24	189

Total figures in seriates, 2337.

Miscellaneous Figures.

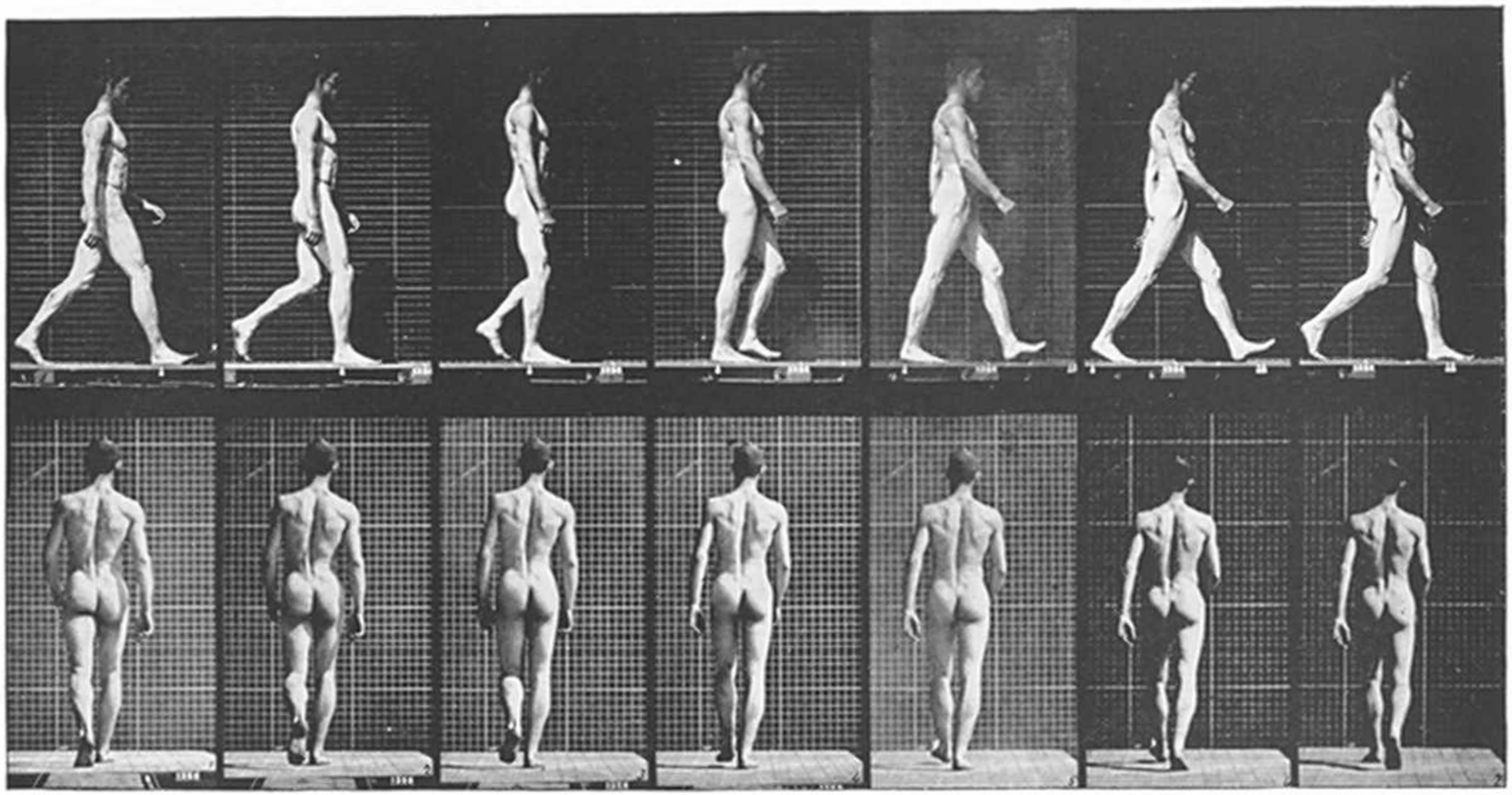
(*Reproduced on the same scale as those in the original work.*)

Class of Model.	Action.	Number of Figures.	Page.
Men (nude or slightly	Walking	9	193
,, [draped)	,, carrying boulder on shoulder	12	195
,, ,,	,, carrying weights in hand ...	12	197
,, ,,	,, under various conditions ...	12	199
,, ,,	Running	8	201
,, ,,	Jumping	8	203
,, ,,	,, ...	11	205
,, ,,	,, ...	9	207

Class of Model.	Action.	Number of Figures.	Page.
Men (nude or slightly	Cricket	10	209
,, [draped)	Heaving boulders	8	211
,, ,,	Baseball, football	7	213
,, ,,	Wrestling	14	215
,, ,,	,, ...	12	217
,, ,,	Fencing, running, and so forth ...	13	219
,, ,,	Striking a blow, and boxing ...	10	221
,, ,,	Boxing	12	223
,, ,,	Blacksmithing	8	225
,, ,,	,, etc.	7	227
Women (nude) ...	Walking under various conditions	11	229
,, ,, ...	,, etc.	9	231
,, ,, ...	Turning round and ascending stairs	9	233
,, ,, ...	,, and ascending stairs with weights in hand	11	235
,, ,, ..	Stooping, and so forth	10	237
,, ,, ...	Throwing	7	239
,, ,, ...	Various movements	8	241

Class of Model.	Action.	Number of Figures.	Page.
Women (semi-draped)	With skipping-rope...	10	243
,, ,,	Jumping, and so forth	10	245
,, ,,	Various actions	12	247
,, ,,	,, ,, ...	11	249
,, (diaphanous	Stooping, descending stairs, etc. ...	8	251
,, [costume)	Dancing	8	253
,, ,,	,, ...	7	255
,, (draped) ...	Miscellaneous actions	7	257
,, ,, ...	,, ,, ...	10	259
,, ,, ...	Lawn-tennis, etc.	11	261
,, ,, ...	Turning round, stooping, etc. ...	10	263
Woman and child ...	Lifting child from the ground ...	8	265
Children	Various actions	9	267
,, ...	Crawling on the ground	6	269
,, ...	Ascending stairs	10	271

Total figures on original scale, 384.



Copyright, 1887, by Eadweard Muybridge.]

SERIES I.

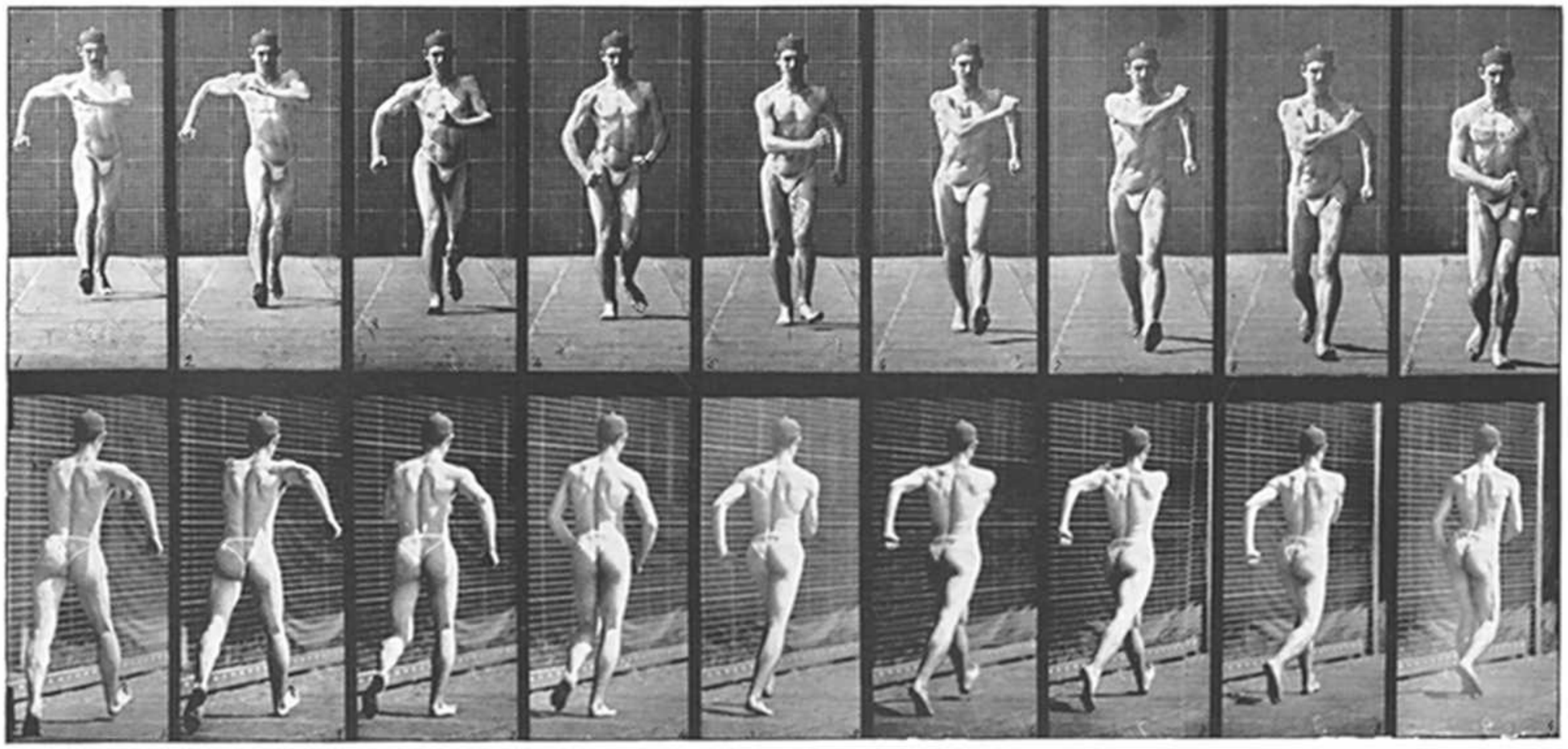
ATHLETE. WALKING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 46.

Time-intervals : ·083 second.

For a similar movement, with larger figures from the original work, see pages 193 and 219.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 2.

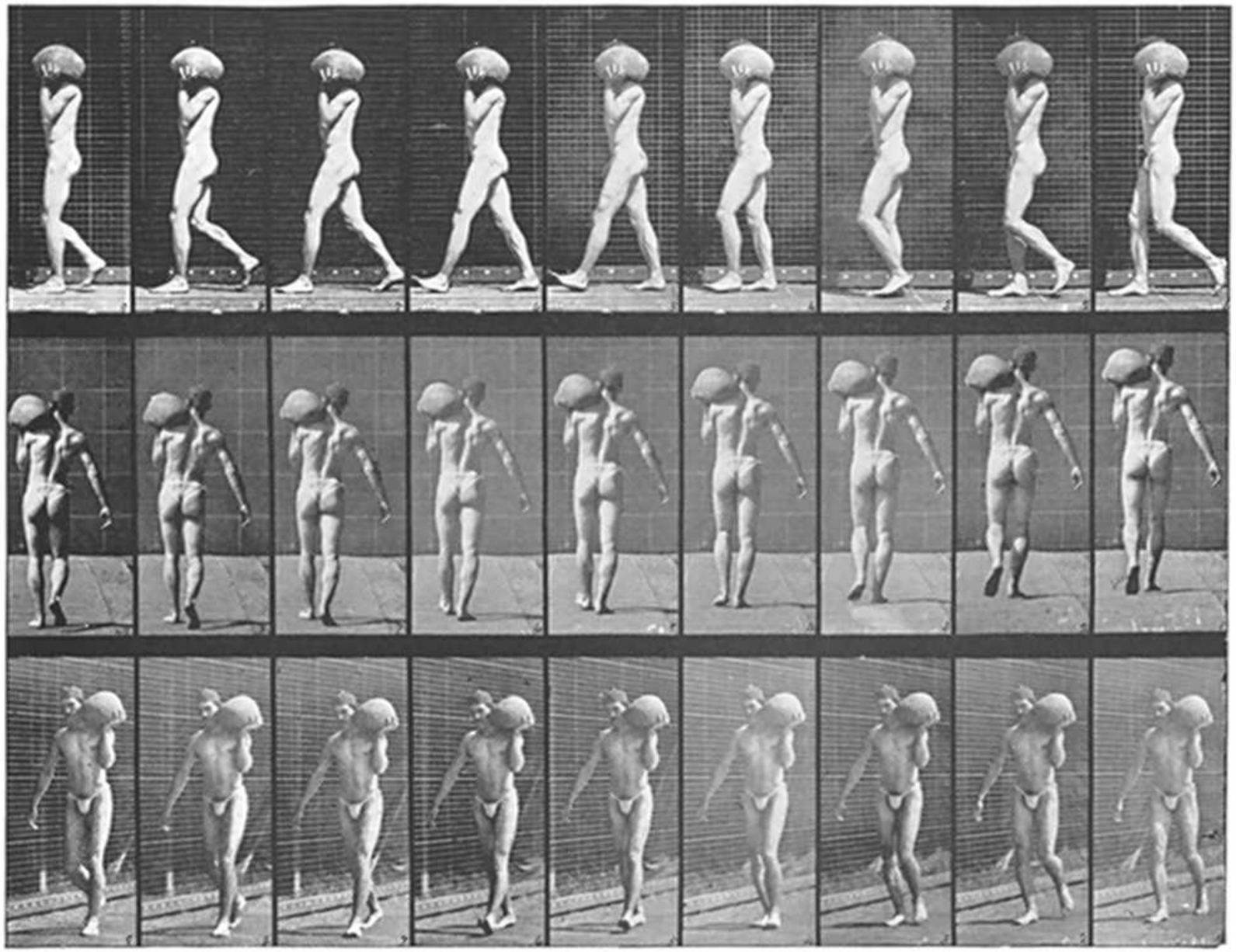
ATHLETE. WALKING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 46.

Time-intervals : ·069 second.

For some phases of a similar movement, with larger figures from the original work, see pages 193 and 219.



Copyright, 1887, by Eadweard Muybridge.]

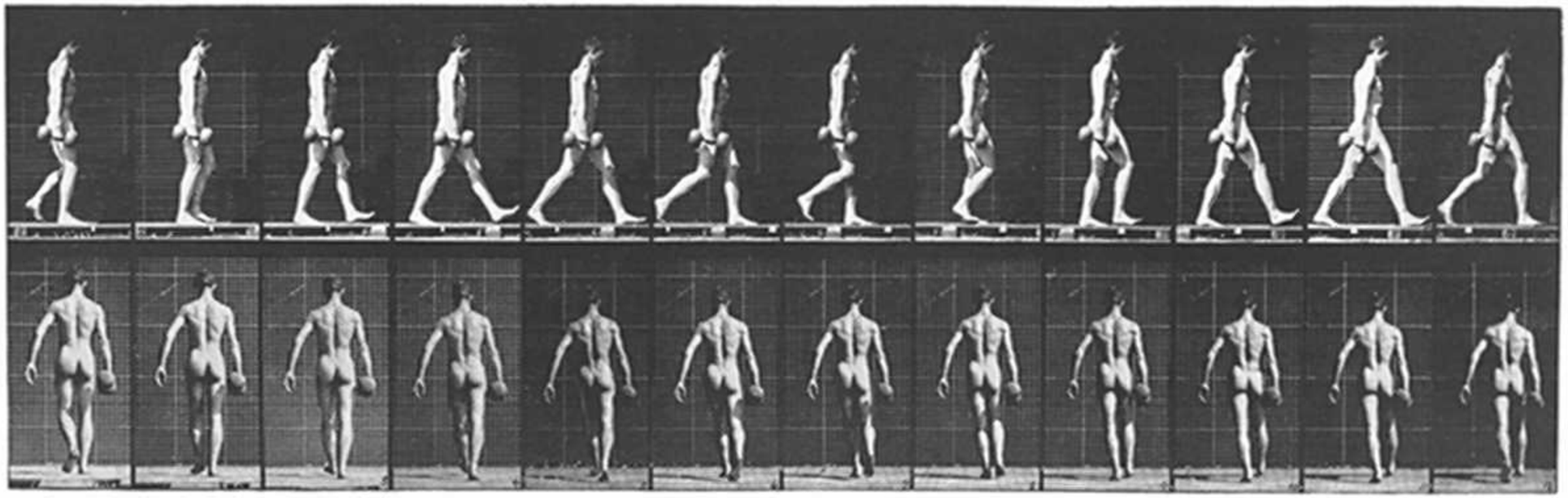
← SERIES 3.

ATHLETE. CARRYING SEVENTY-FIVE POUND BOULDER.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 46. Time-intervals : ·075 second.

For some of these phases, from the original work, see page 195.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 4.

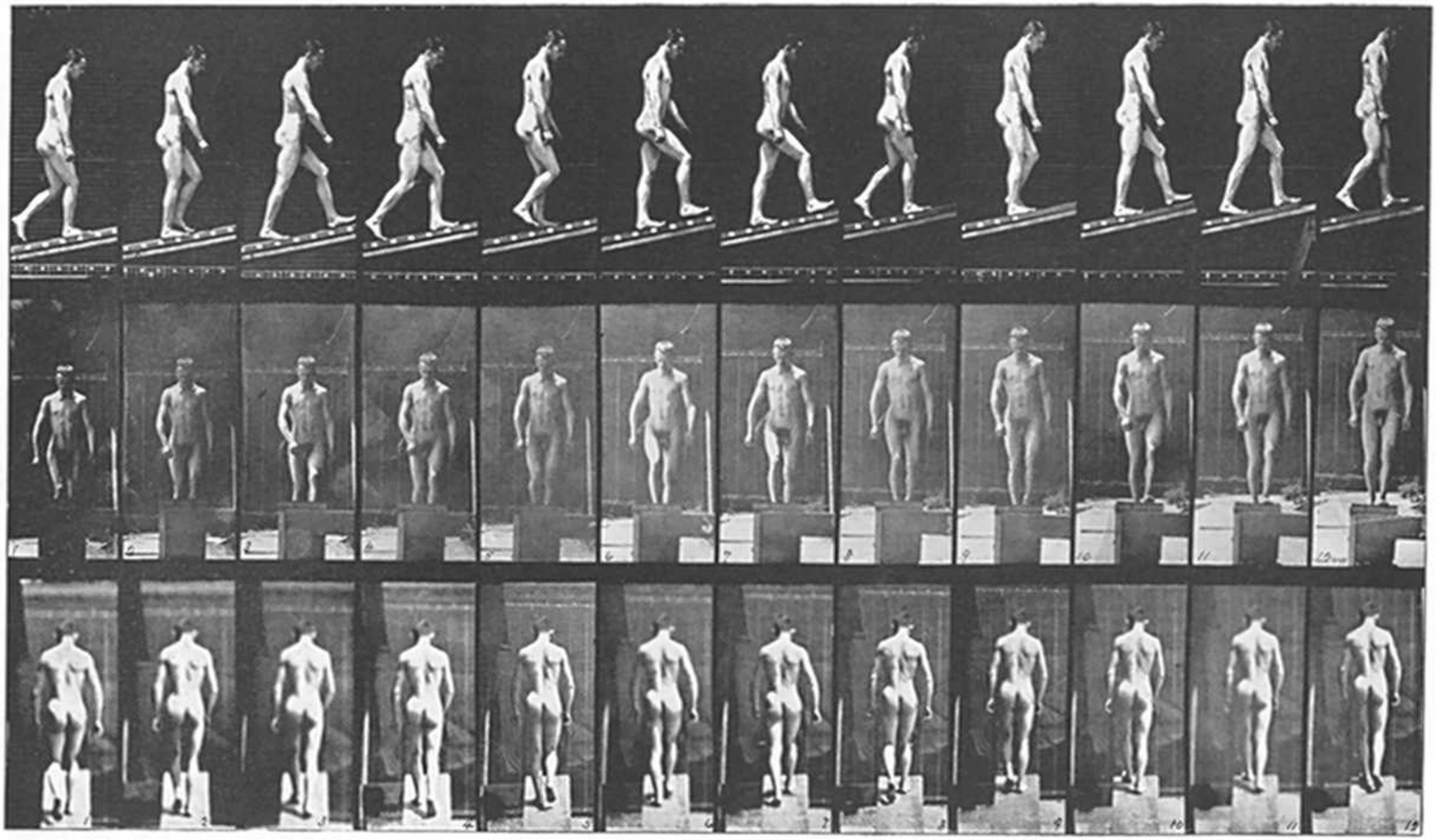
ATHLETE. WALKING, WITH FIFTY-POUND WEIGHT IN ONE HAND.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 46.

Time-intervals: ·099 second.

For some of these phases, from the original work, see page 197.



Copyright, 1885, by Eadweard Muybridge.]

SERIES 5.

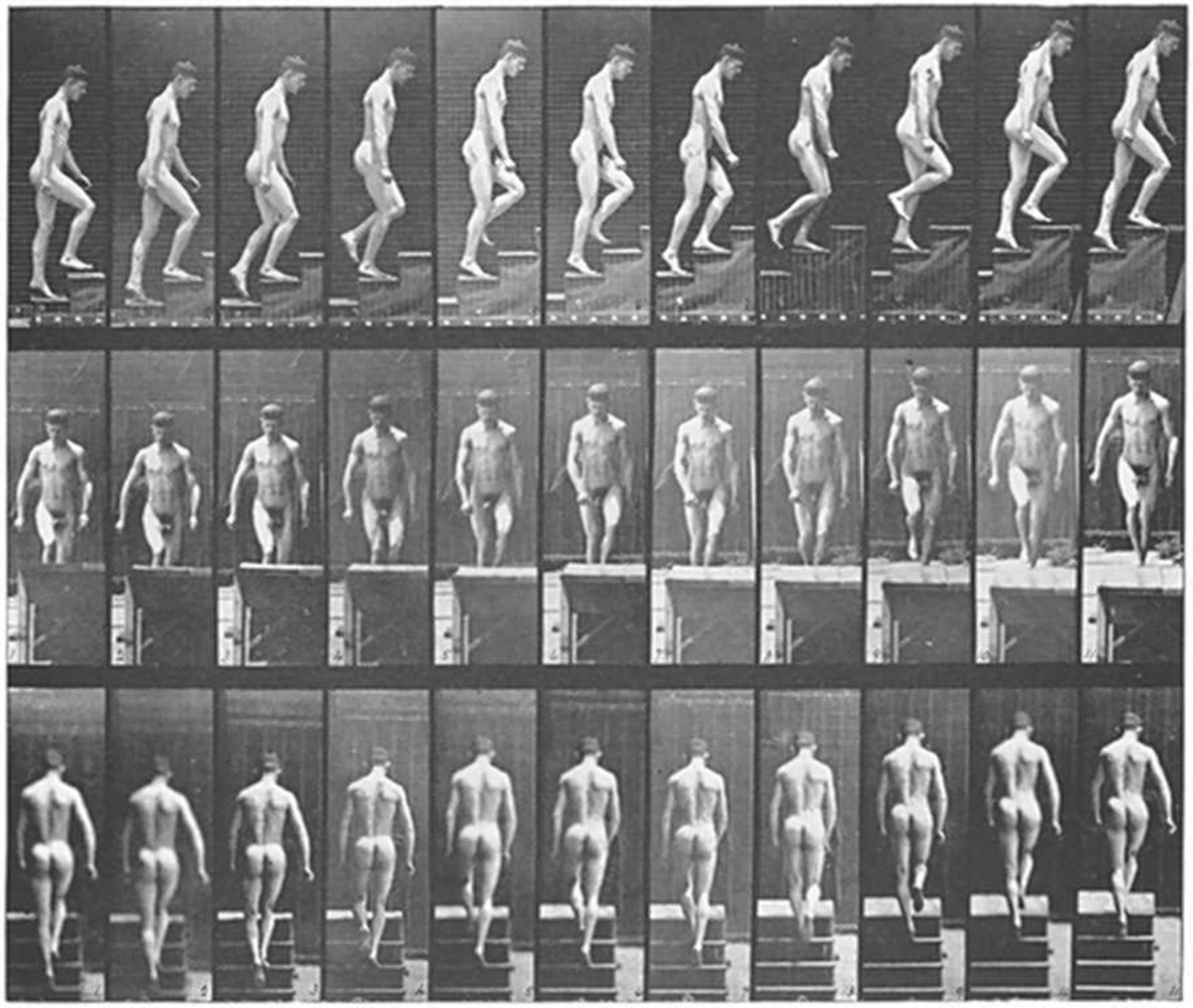
ATHLETE. ASCENDING AN INCLINE.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 36.

Time-intervals : ·168 second.

For some of these phases, from the original work, see page 199.



Copyright, 1887, by Eadweard Muybridge.]

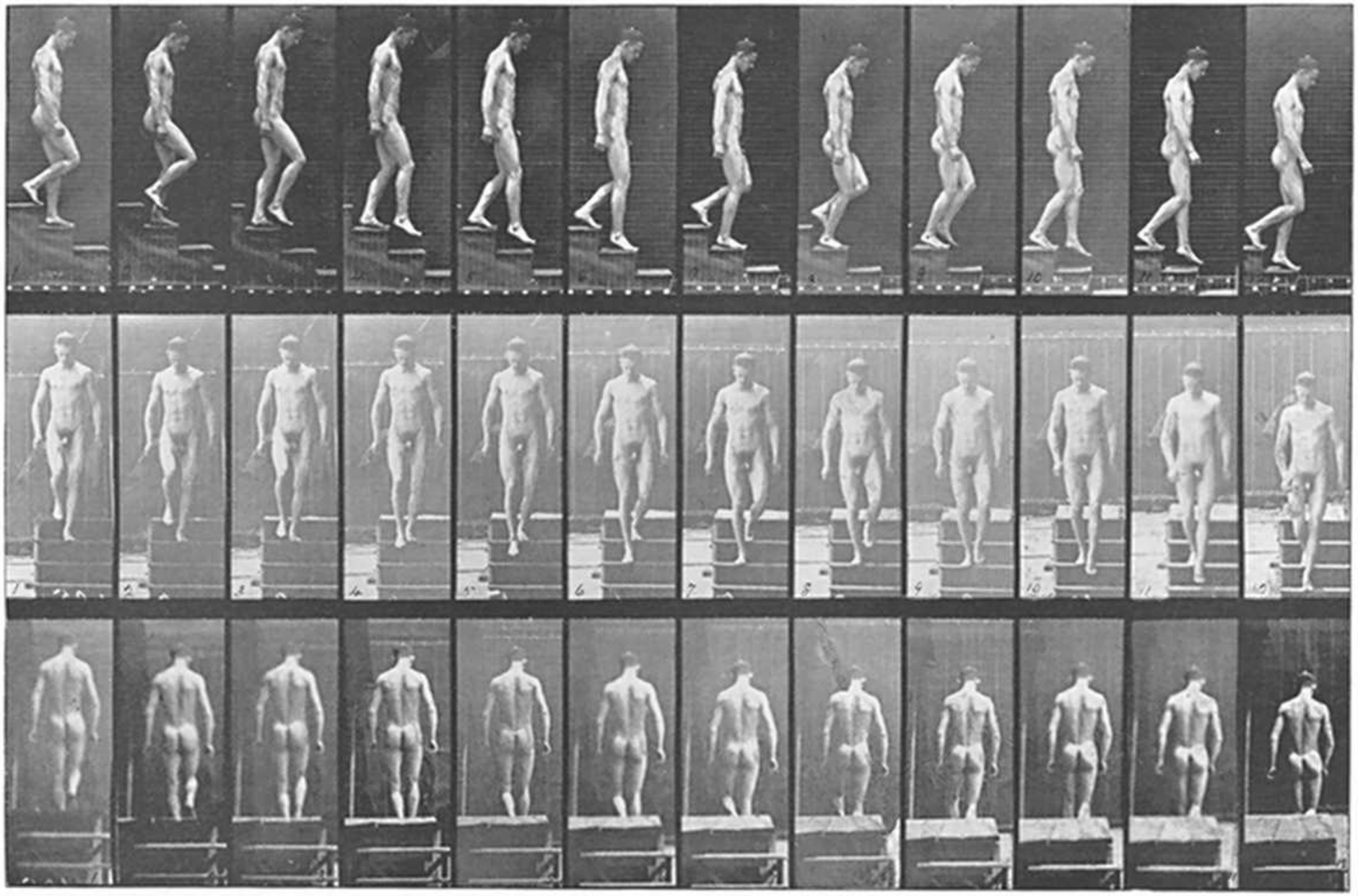
SERIES 6.

ATHLETE. ASCENDING A STAIRWAY.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 36. Time-intervals : ·128 second.

For some of these phases, from the original work, see page 199.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 7.

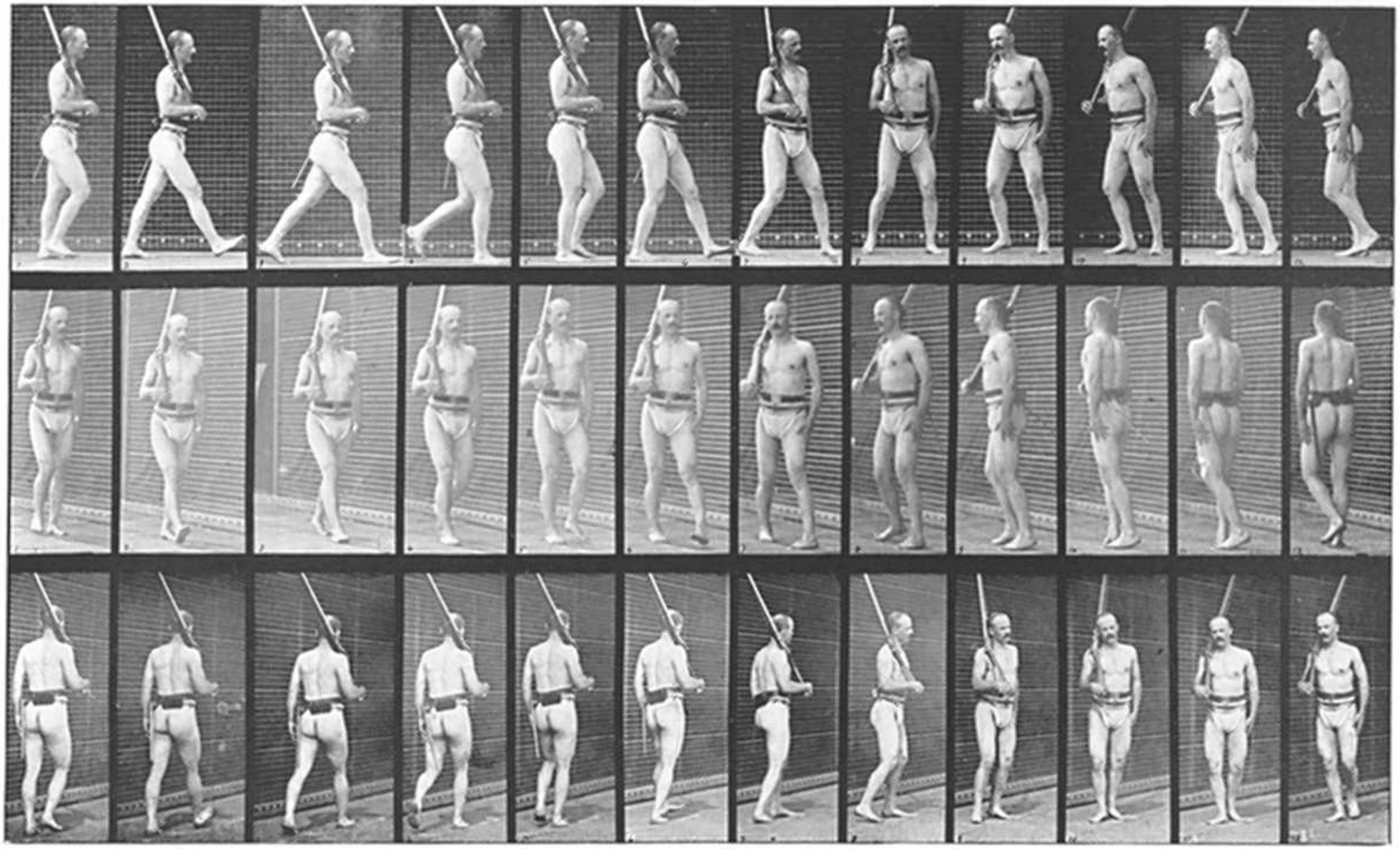
ATHLETE. DESCENDING STAIRWAY.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 36.

Time-intervals : ·092 second.

For a phase of this series, from the original work, see page 199.



Copyright, 1887, by Eadweard Muybridge.]

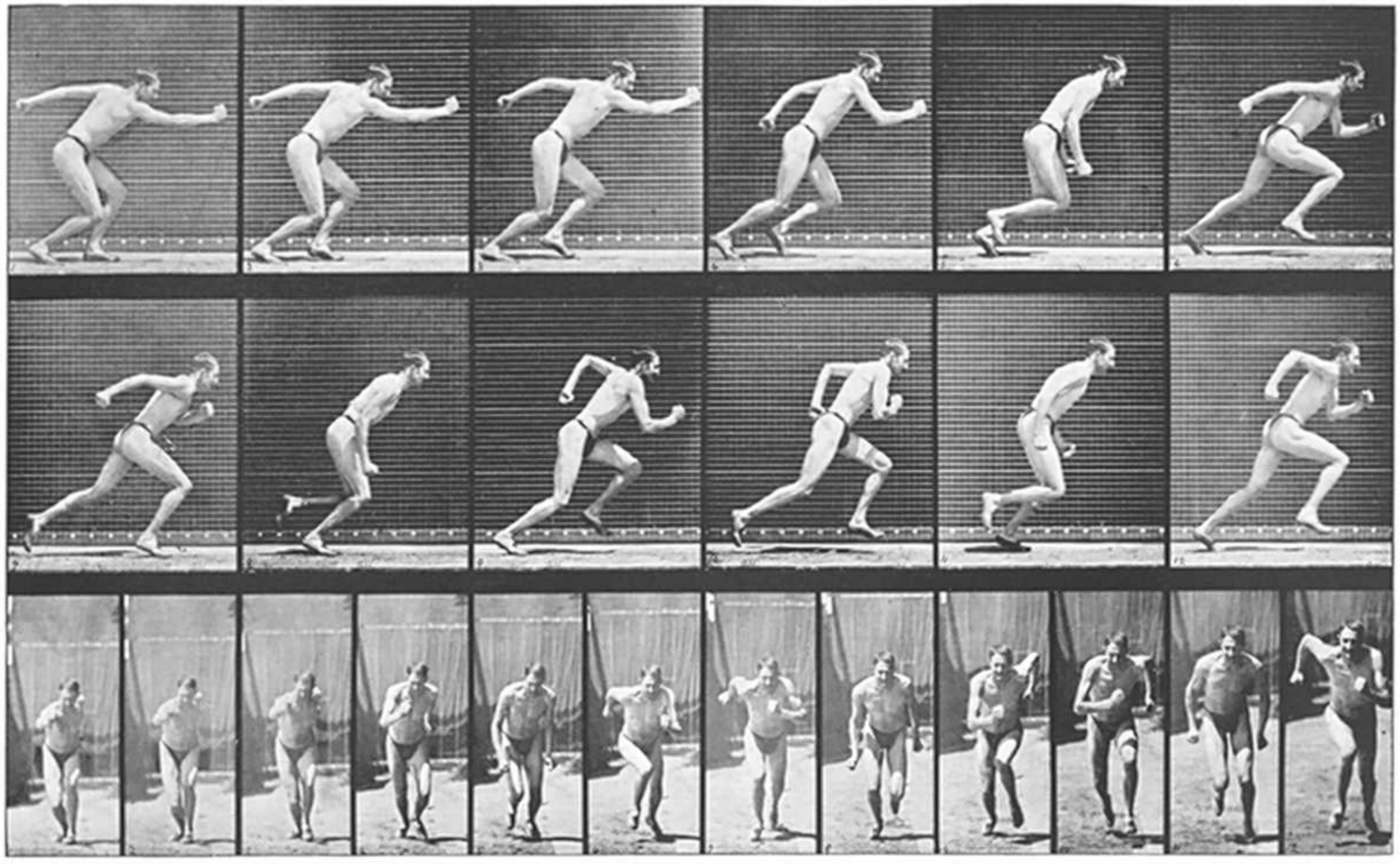
SERIES 8.

SOLDIER. ON GUARD.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 60.

Time-intervals: ·161 second.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 9.

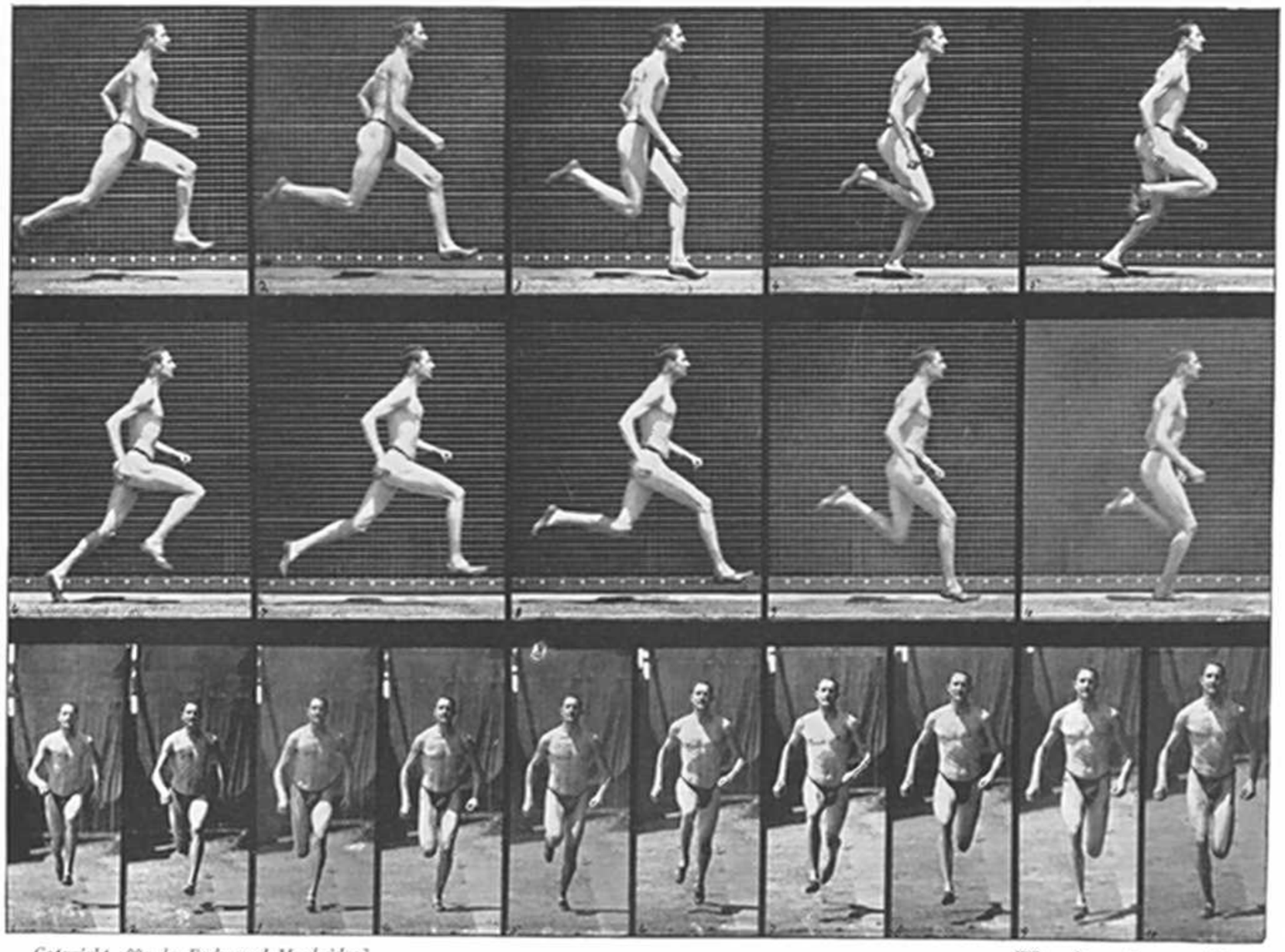
ATHLETE. STARTING ON A RACE.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 37.

Time-intervals : ·093 second.

For some of these phases, from the original work, see page 201.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 10.

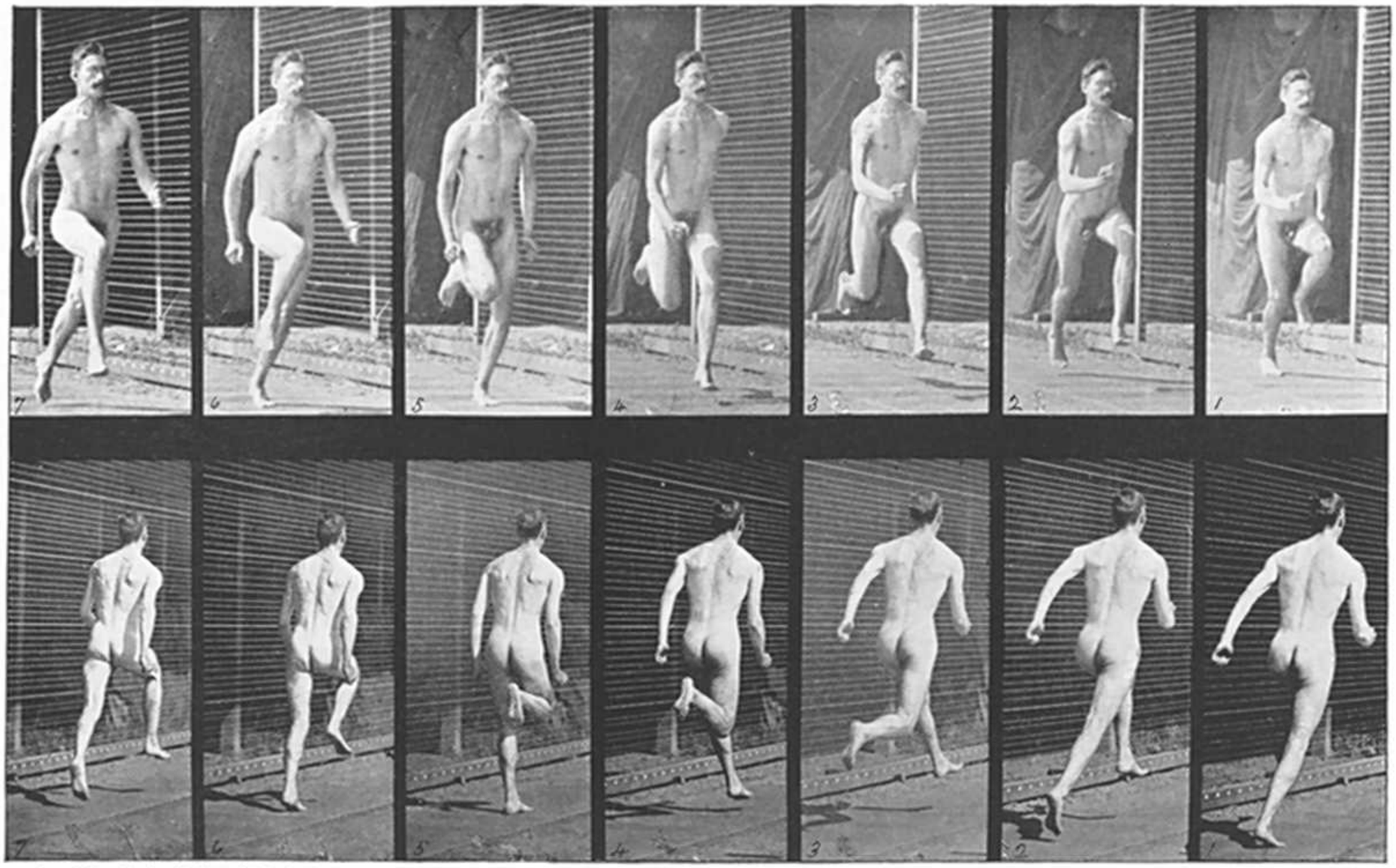
ATHLETE. RUNNING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 37.

Time-intervals: ·042 second.

For some similar phases, from the original work, see page 201.



Copyright, 1887, by Eadweard Muybridge.]

SERIES II.

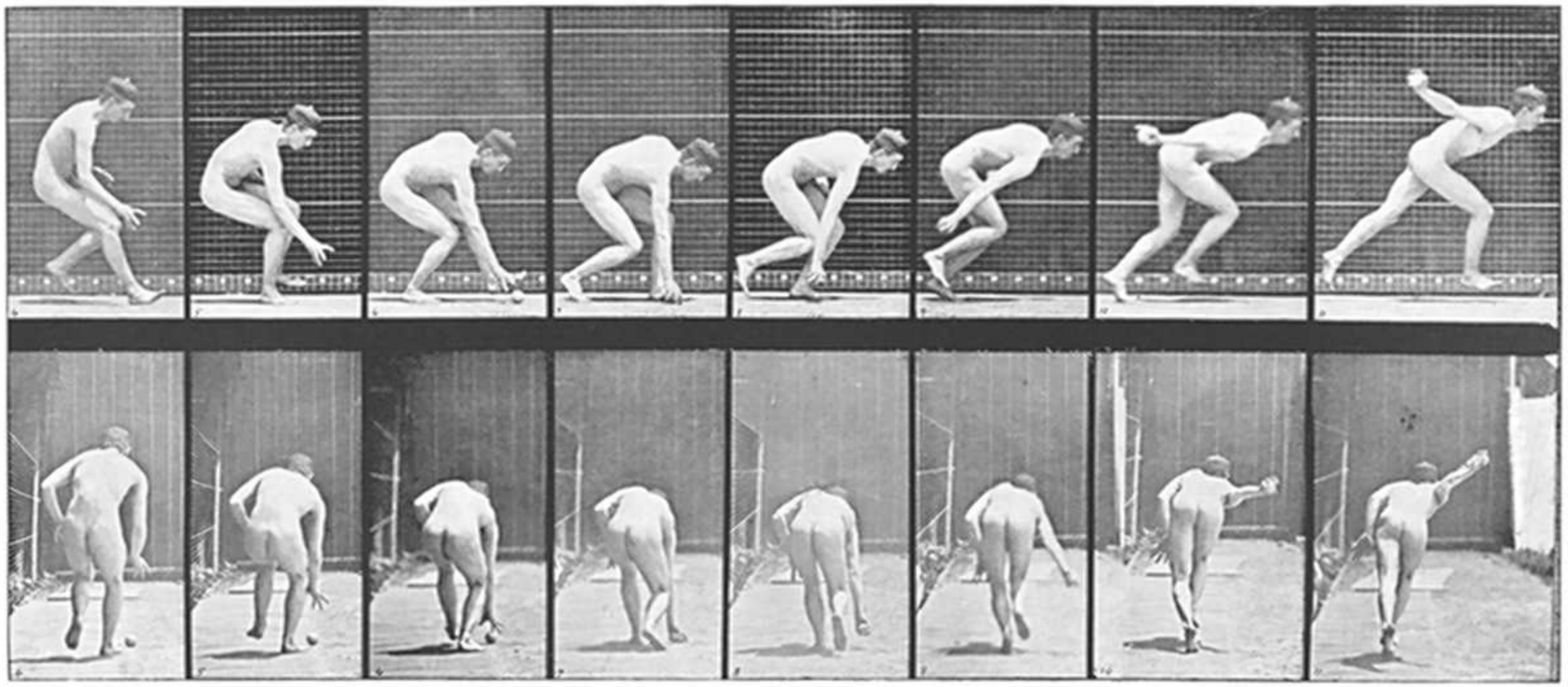
ATHLETE. RUNNING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 55.

Time-intervals : ·057 second.

For one of these phases, from the original work, see page 219.



Copyright, 1887, by Eadweard Muybridge.]

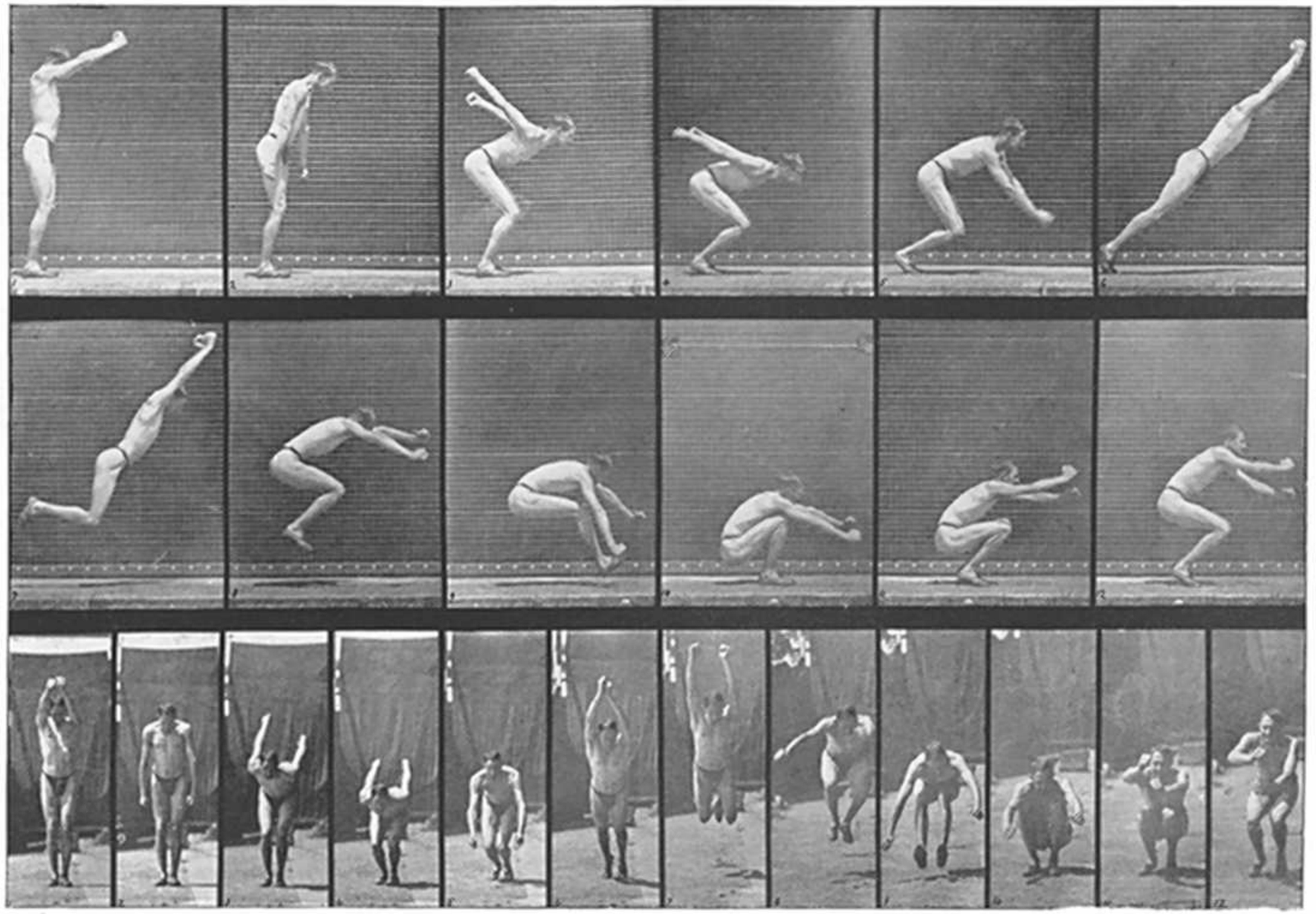
SERIES 12.

ATHLETE. RUNNING AND PICKING UP A BALL.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 26.

Time-intervals : ·075 second.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 13.

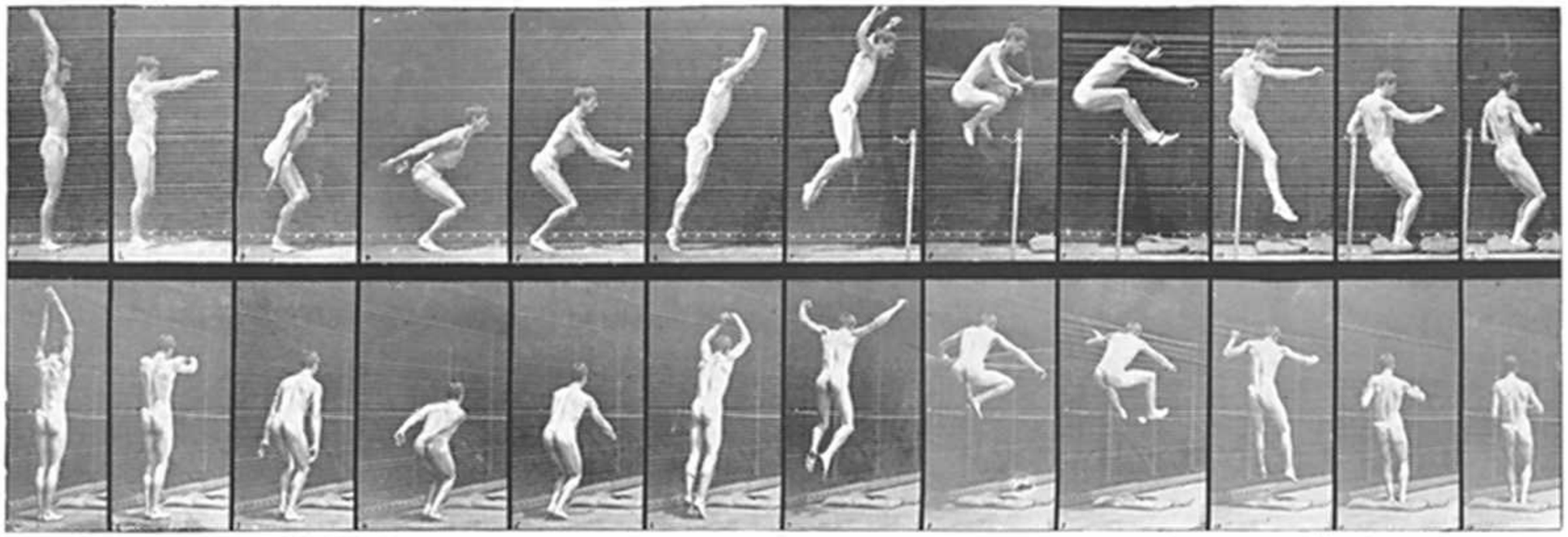
ATHLETE. STANDING BROAD JUMP.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 37.

Time-intervals : ·156 second.

For some of these phases, from the original work, see page 203.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 14.

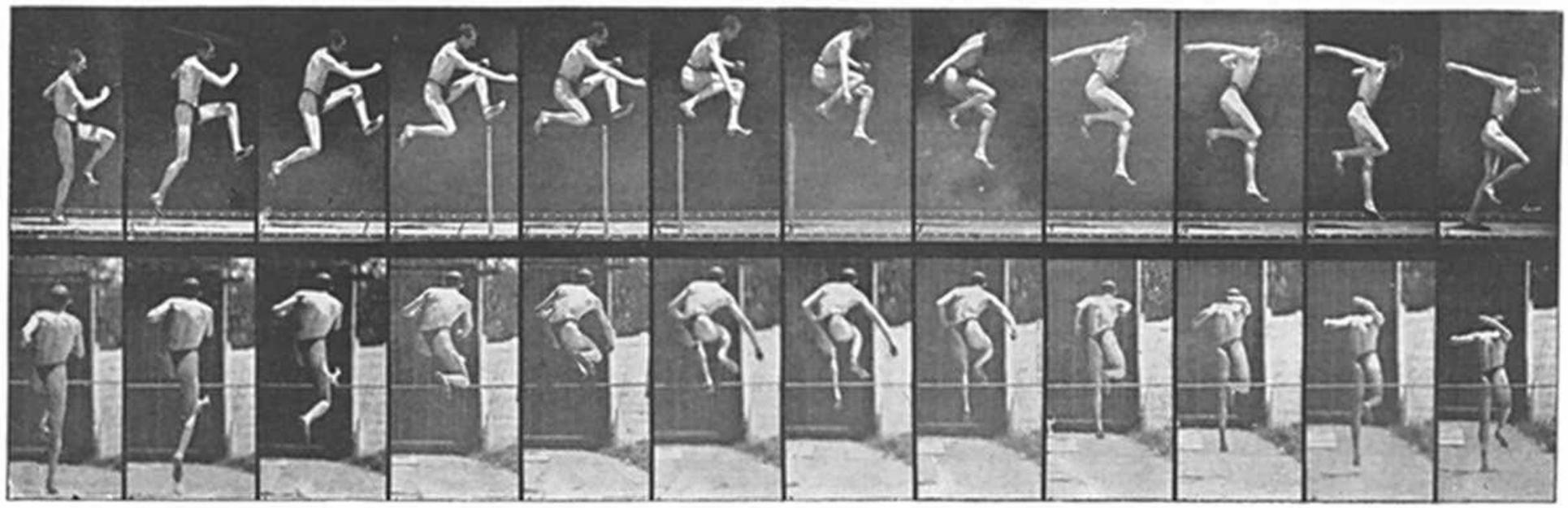
ATHLETE. STANDING HIGH JUMP.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 40.

Time-intervals : ·139 second.

For some of these phases, from the original work, see page 205.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 15.

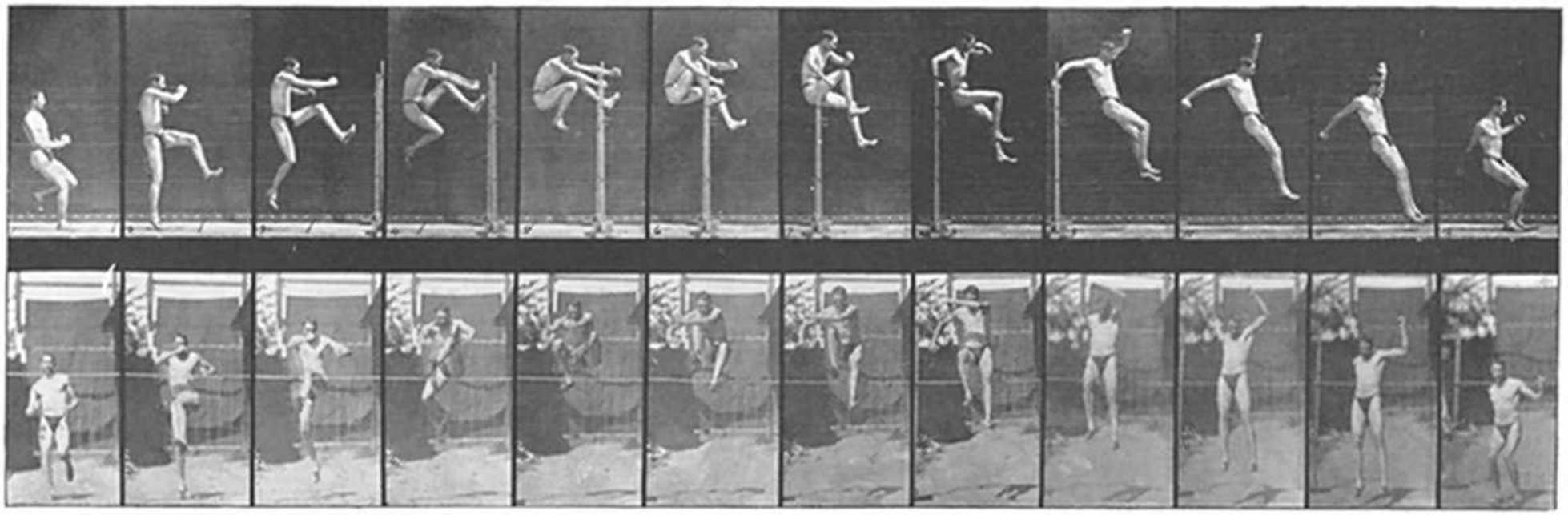
ATHLETE. A STRAIGHT HIGH JUMP.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 37.

Time-intervals : ·063 second.

For similar phases, from the original work, see page 205.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 16.

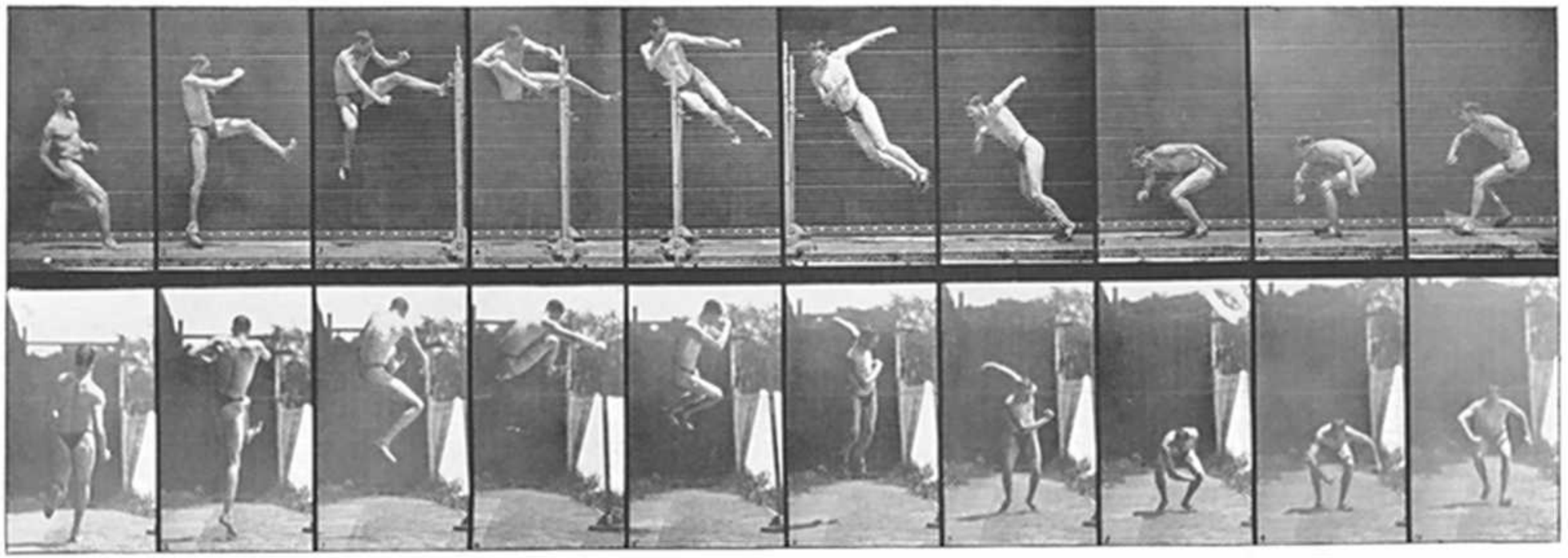
ATHLETE. A RUNNING, STRAIGHT HIGH JUMP.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 37.

Time-intervals : ·087 second.

For similar phases, from the original work, see page 205.



Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 17.

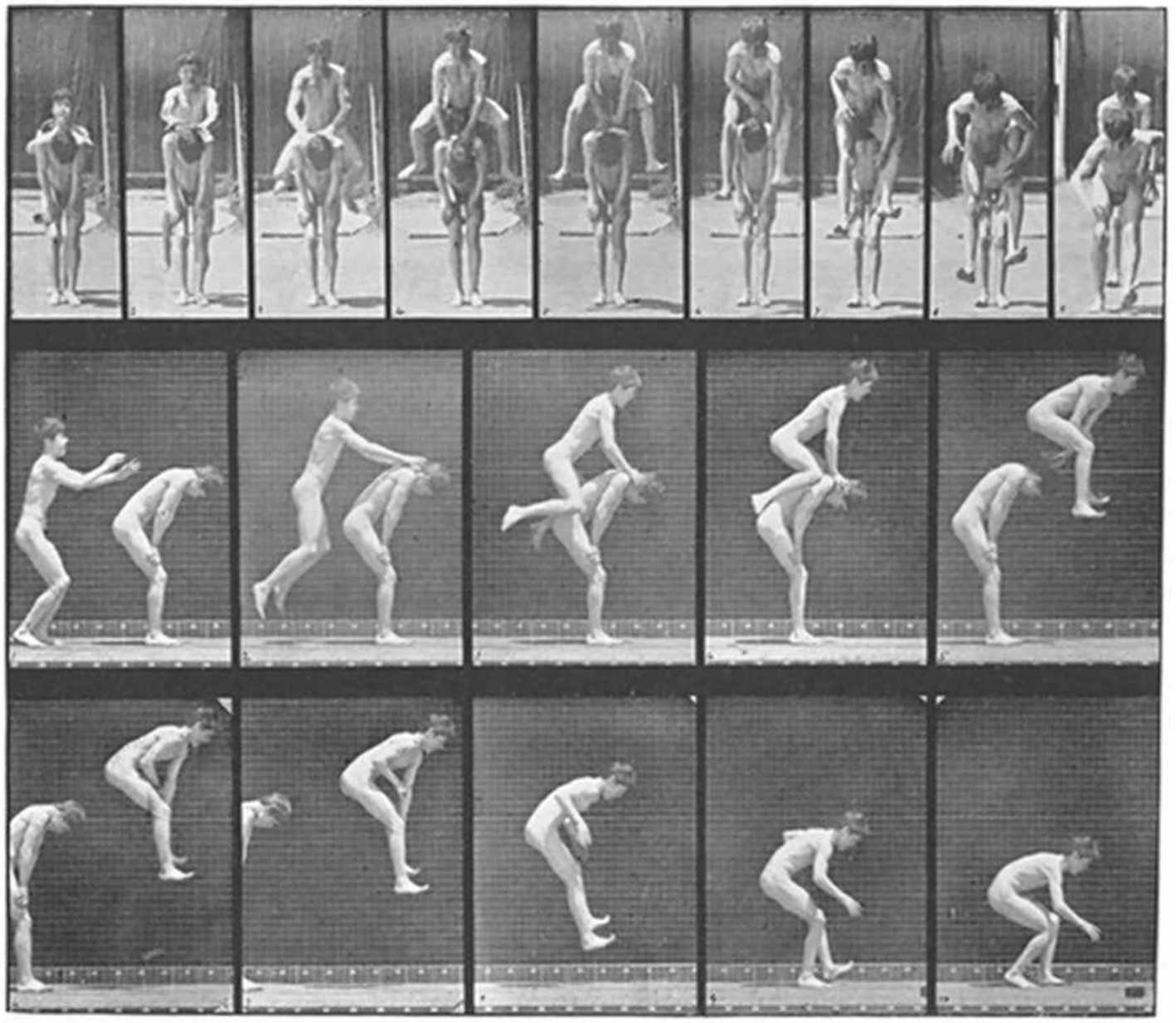
ATHLETE. A RUNNING, TWIST HIGH JUMP.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 37.

Time-intervals : ·160 second.

For some of these phases, from the original work, see page 205.



Copyright, 1887, by Eadweard Muybridge.]

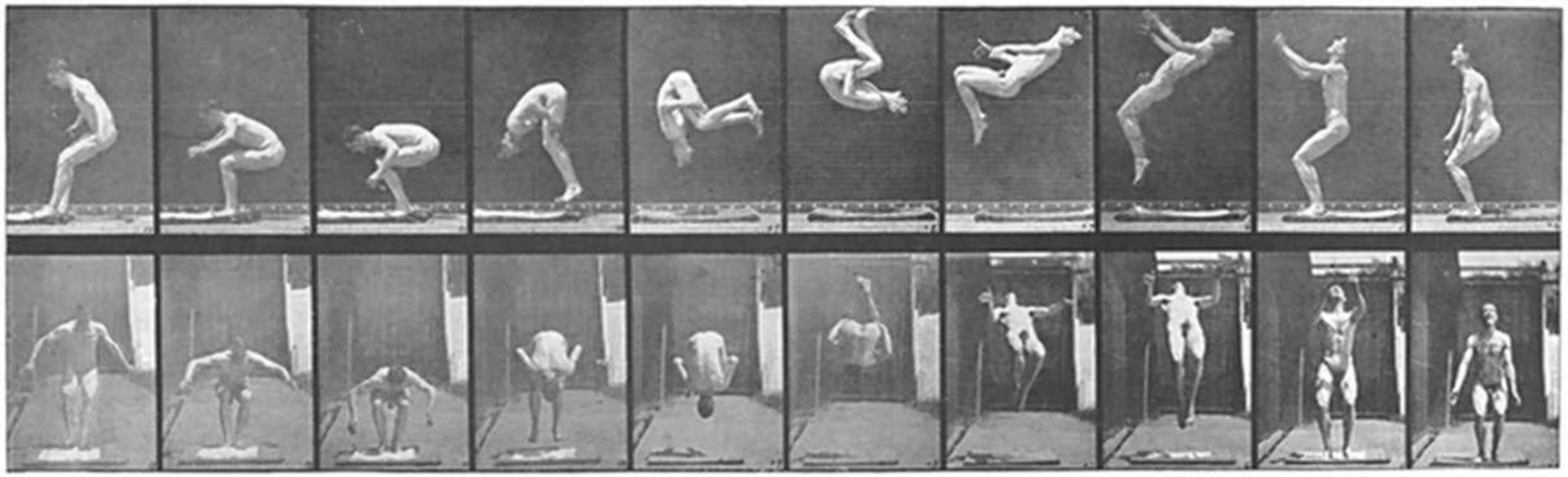
SERIES 18.

BOYS. PLAYING AT "LEAP-FROG."

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Models 27 and 28. Time-intervals : '109 second.

For some of these phases, from the original work, see page 207.



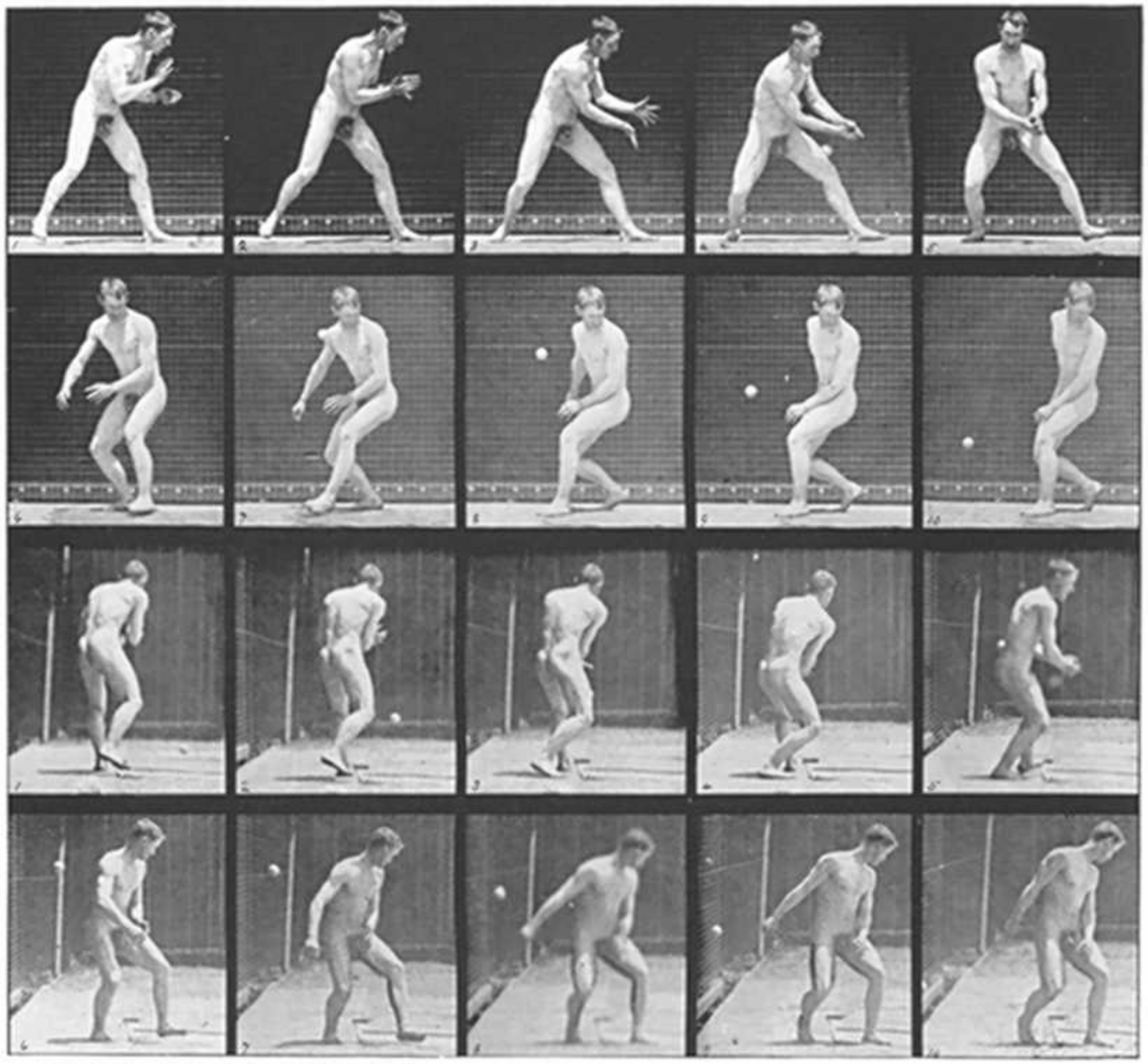
Copyright, 1887, by Eadweard Muybridge.]

← SERIES 19.

ATHLETE. TURNING A BACK SOMERSAULT.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 33.



Copyright, 1887, by Eadweard Muybridge.]

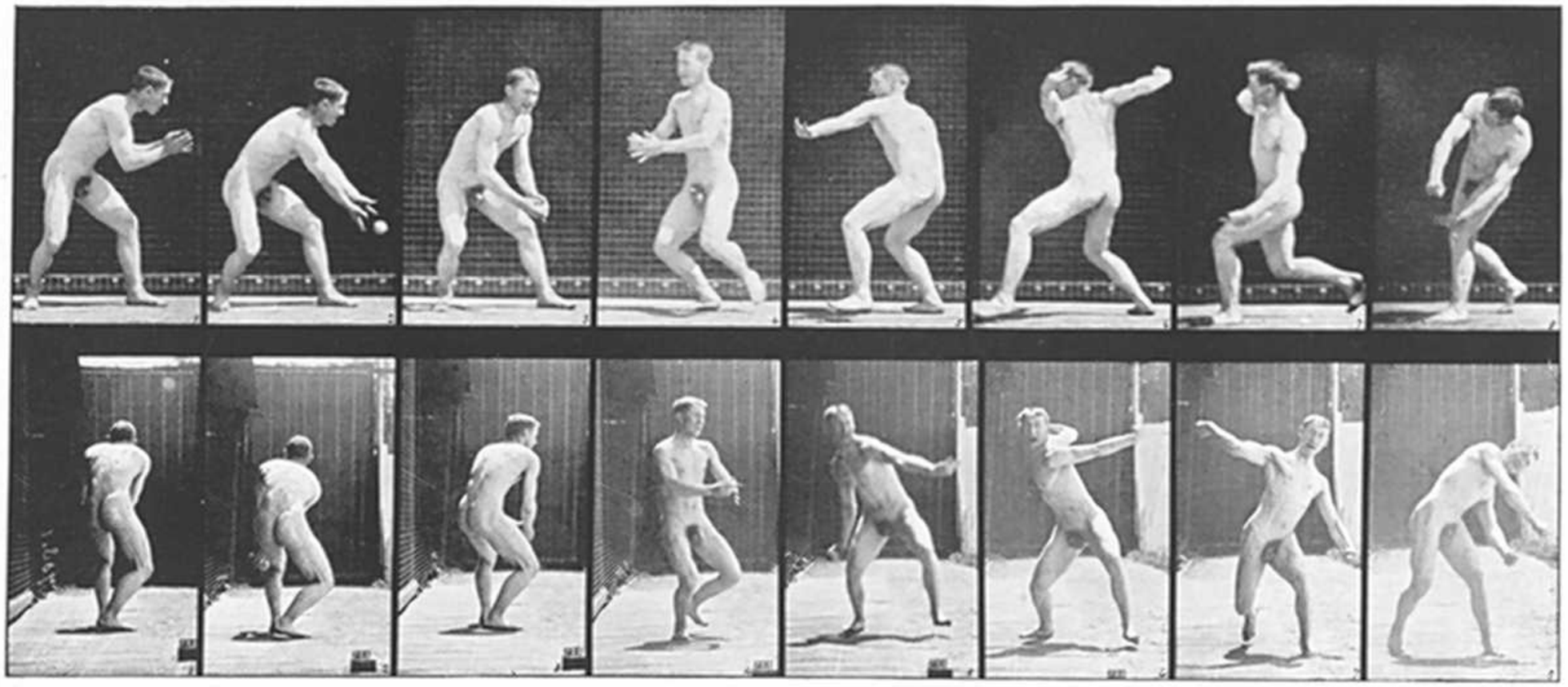
SERIES 20.

ATHLETE. CATCHING AT A BALL: "ERROR."

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 30. Time-intervals : ·108 second.

For a phase of this series, from the original work, see page 227.



Copyright, 1887, by Eadweard Muybridge.]

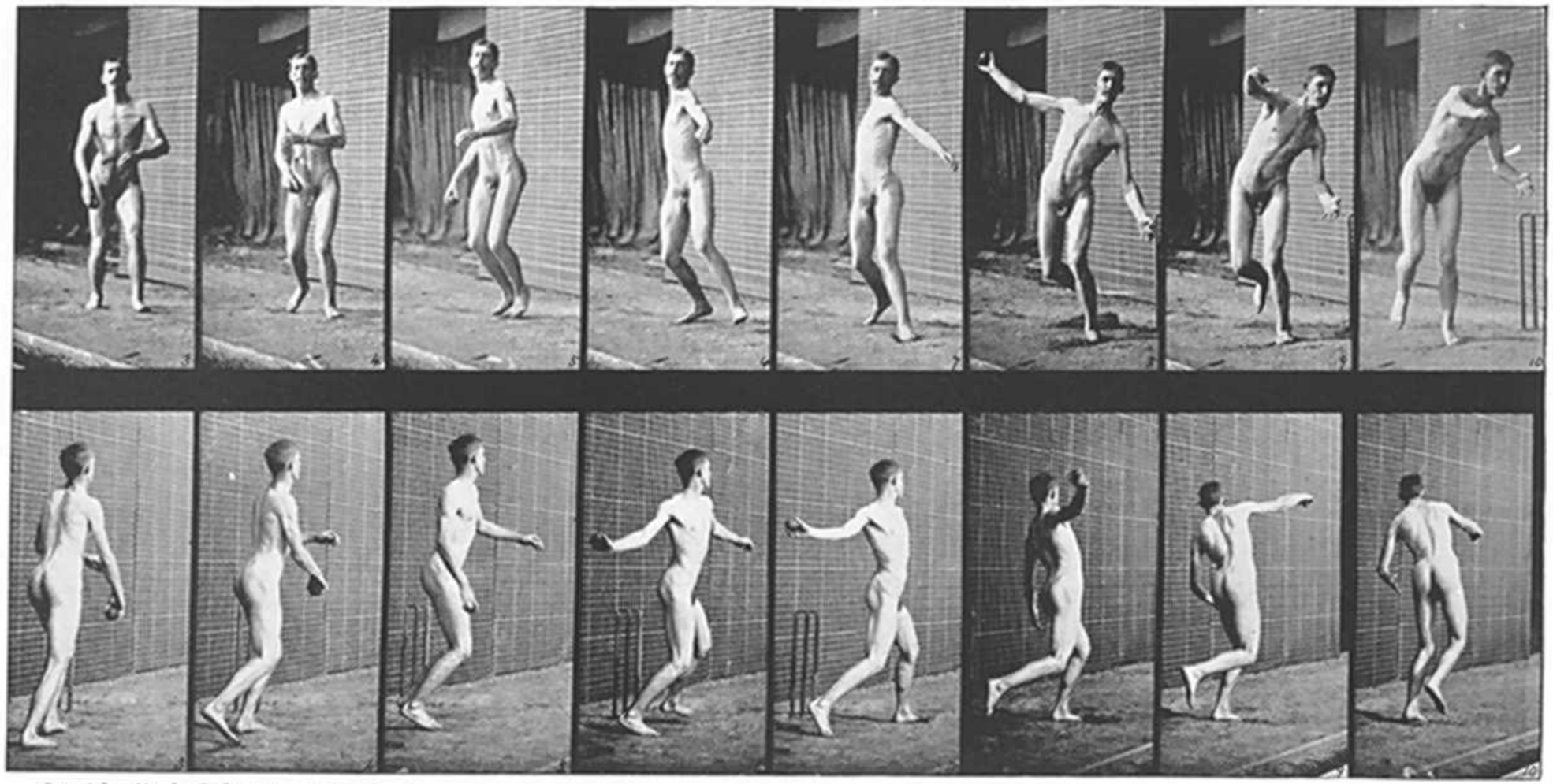
SERIES 21.

ATHLETE. CATCHING AND THROWING AT BASE-BALL.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 30.

Time-intervals : ·201 second.



Copyright, 1887, by Eadweard Muybridge.]

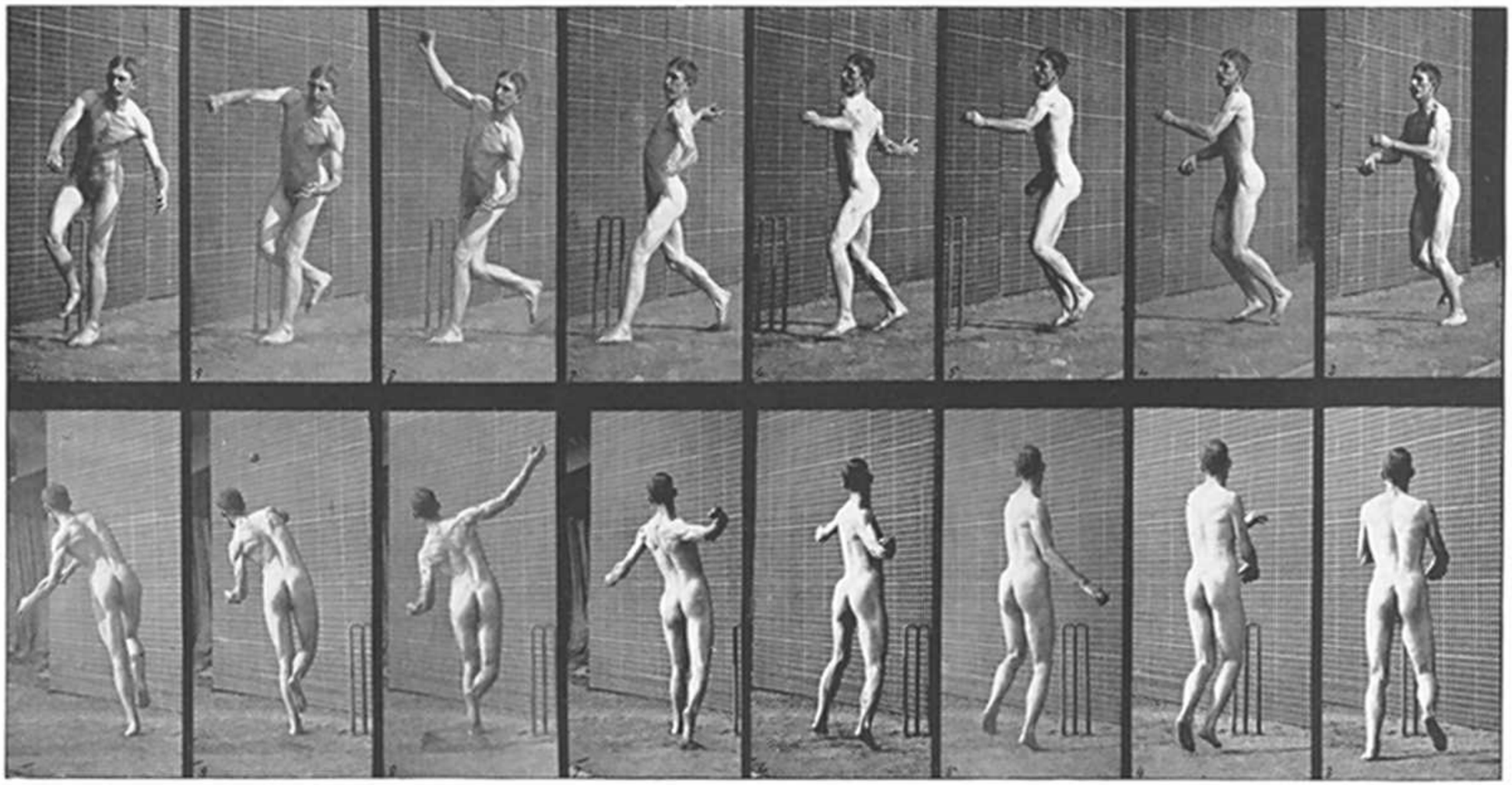
SERIES 22.

ATHLETE. BOWLING AT CRICKET.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 69.

For some of these phases, from the original work, see page 209.



Copyright, 1887, by Eadweard Muybridge.]

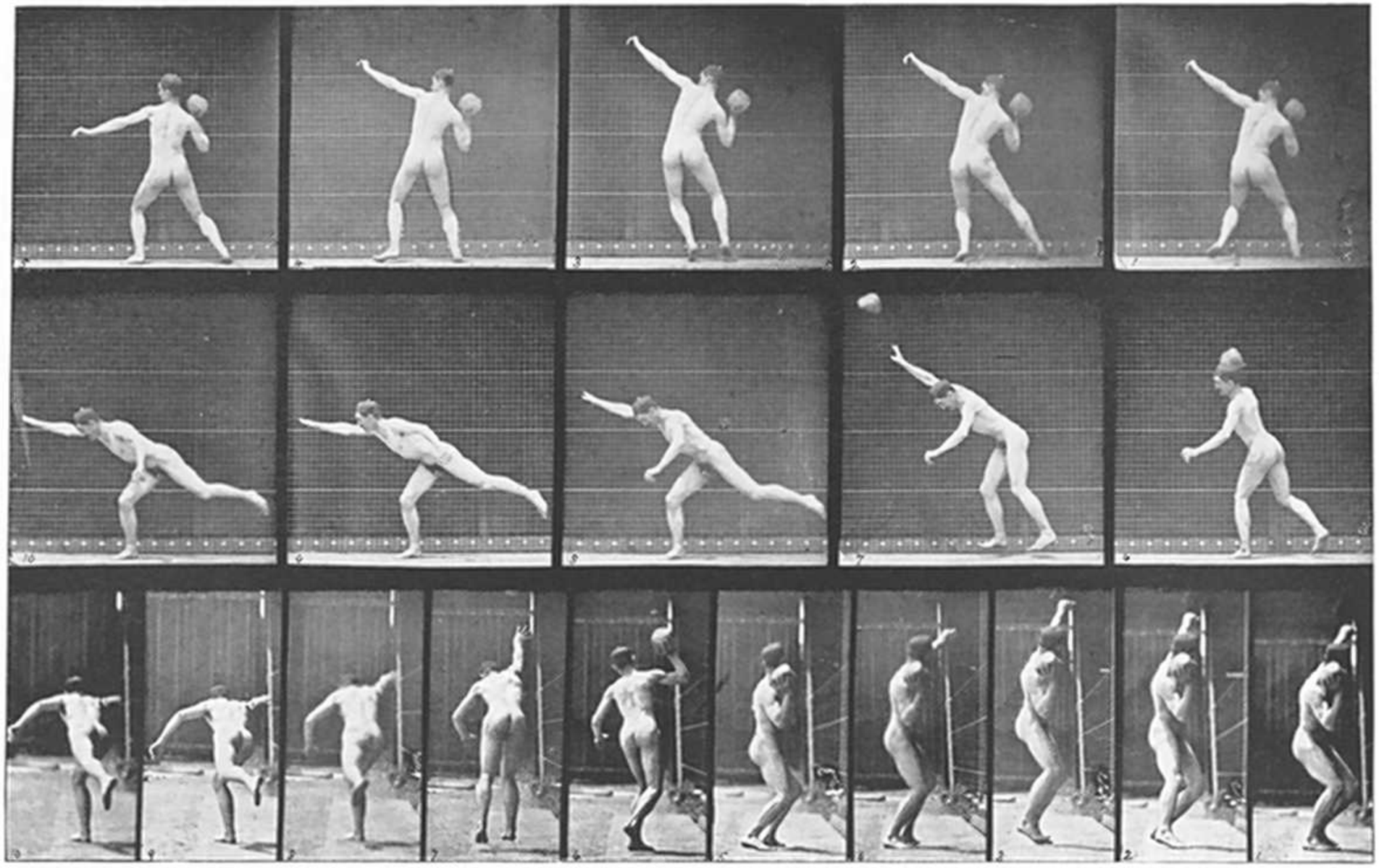
← SERIES 23.

ATHLETE. OVER-ARM BOWLING AT CRICKET.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 69.

For some of these phases, from the original work, see page 209.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 24.

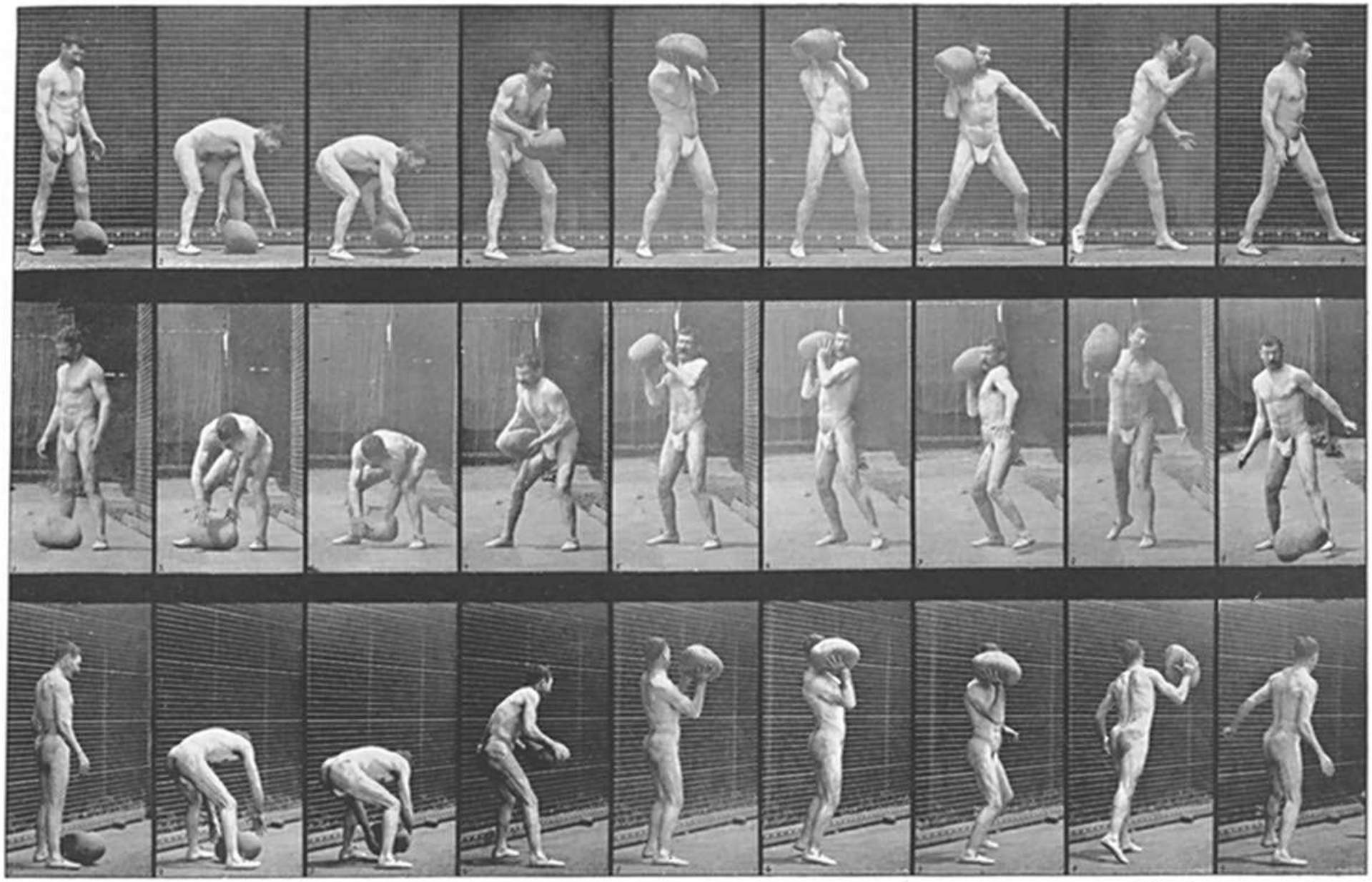
ATHLETE. HEAVING A 20-POUND ROCK.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 46.

Time-intervals : ·145 second.

For phases of a similar action, from the original work, see page 211.



Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 25.

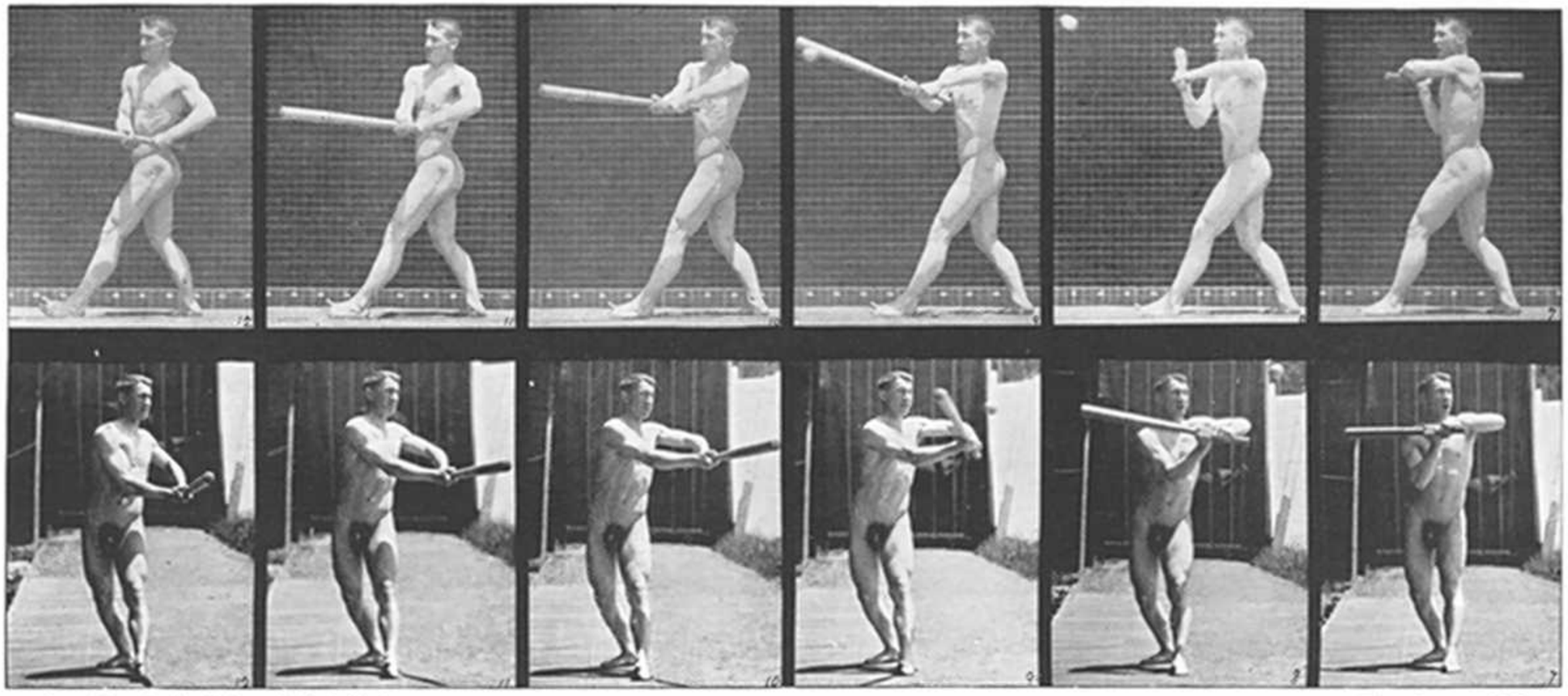
ATHLETE. HEAVING 75-POUND ROCK.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 52.

Time-intervals : ·489 second.

For some of these phases, from the original work, see page 211.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 26.

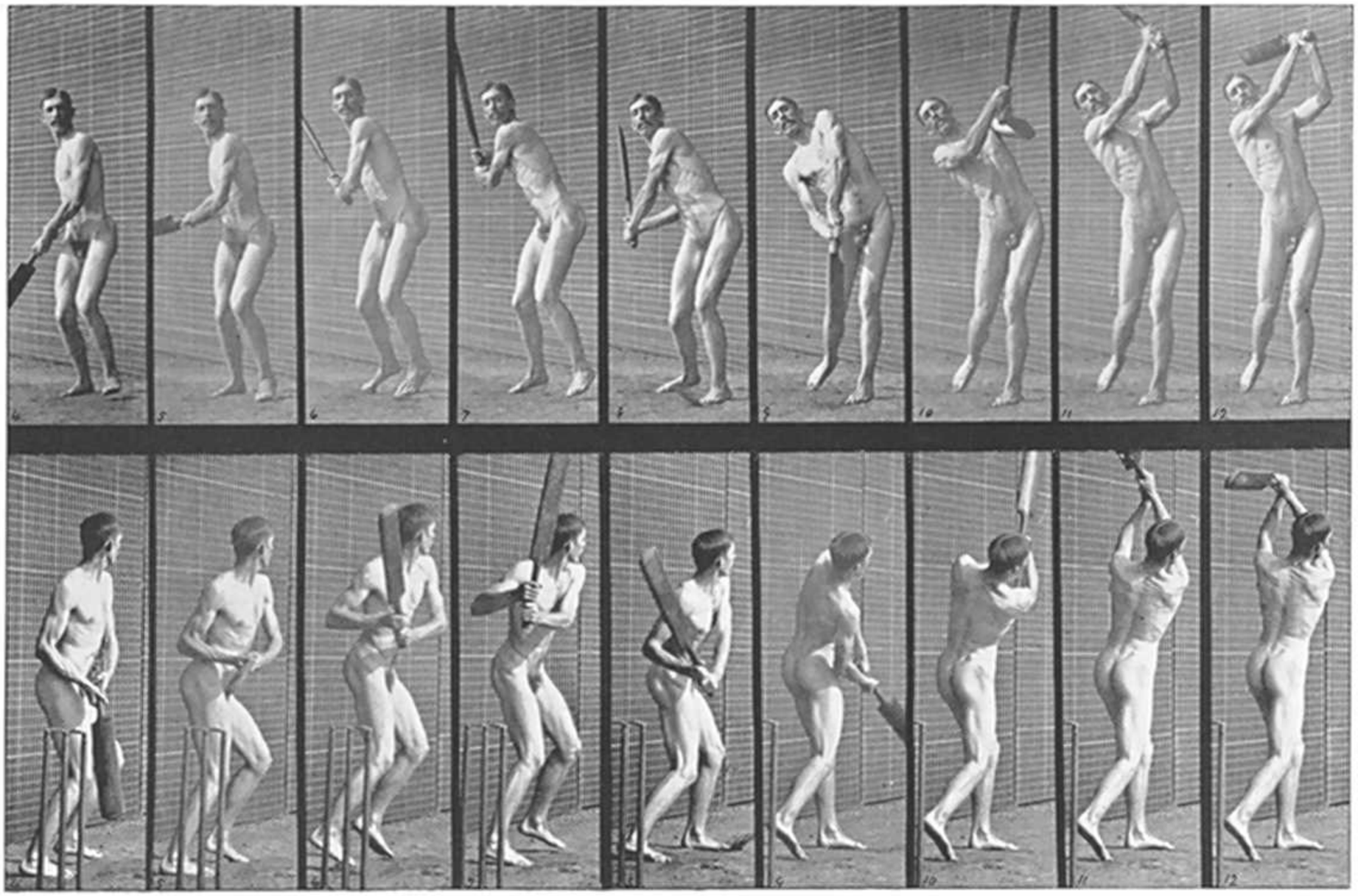
ATHLETE. BATTING AT BASE-BALL.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 30.

Time-intervals : ·085 second.

For some of these phases, from the original work, see page 213.



Copyright, 1887, by Eadweard Muybridge.]

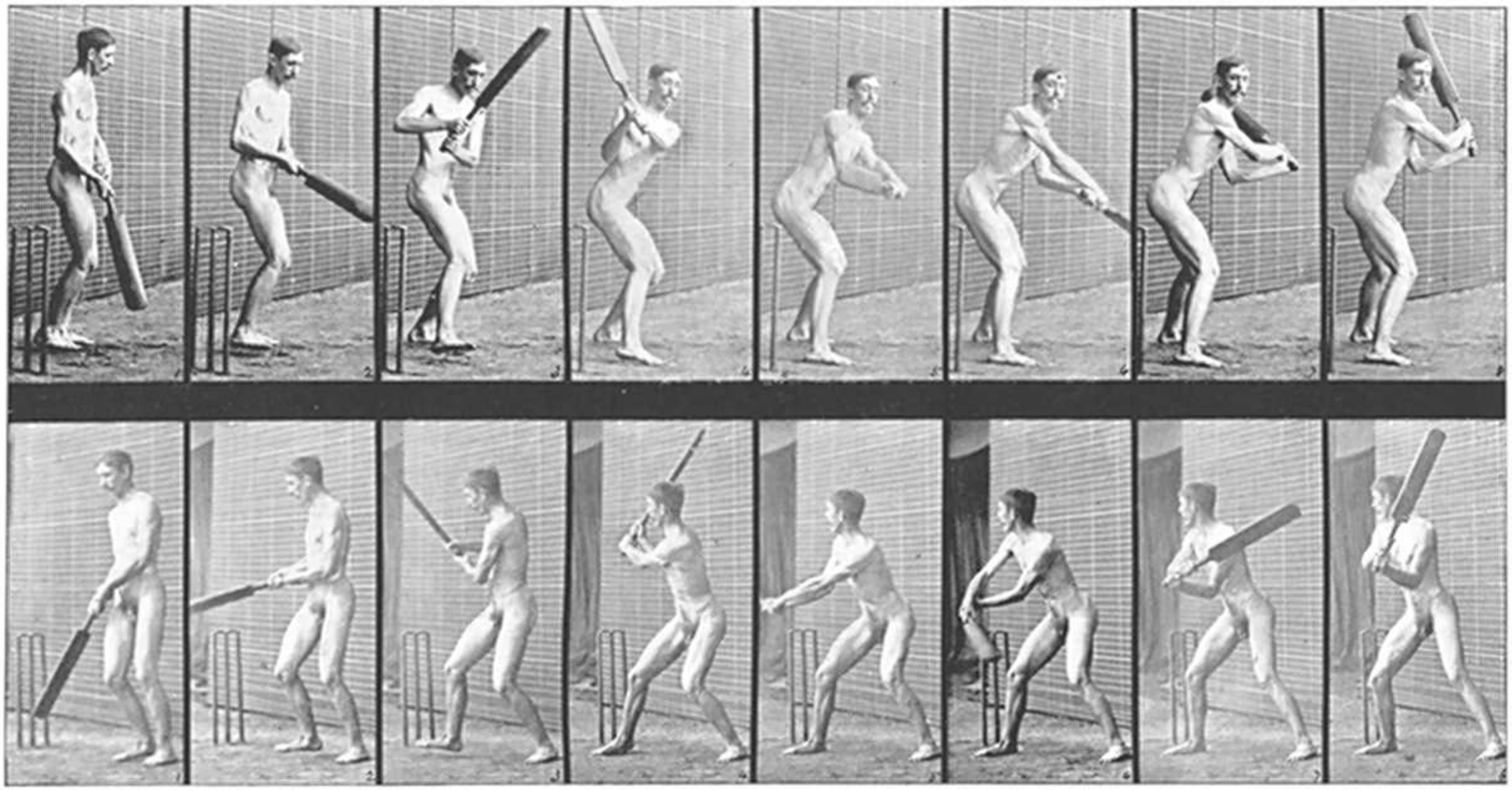
SERIES 27.

ATHLETE. BATTING AT CRICKET.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 69.

For some of these phases, from the original work, see page 209.



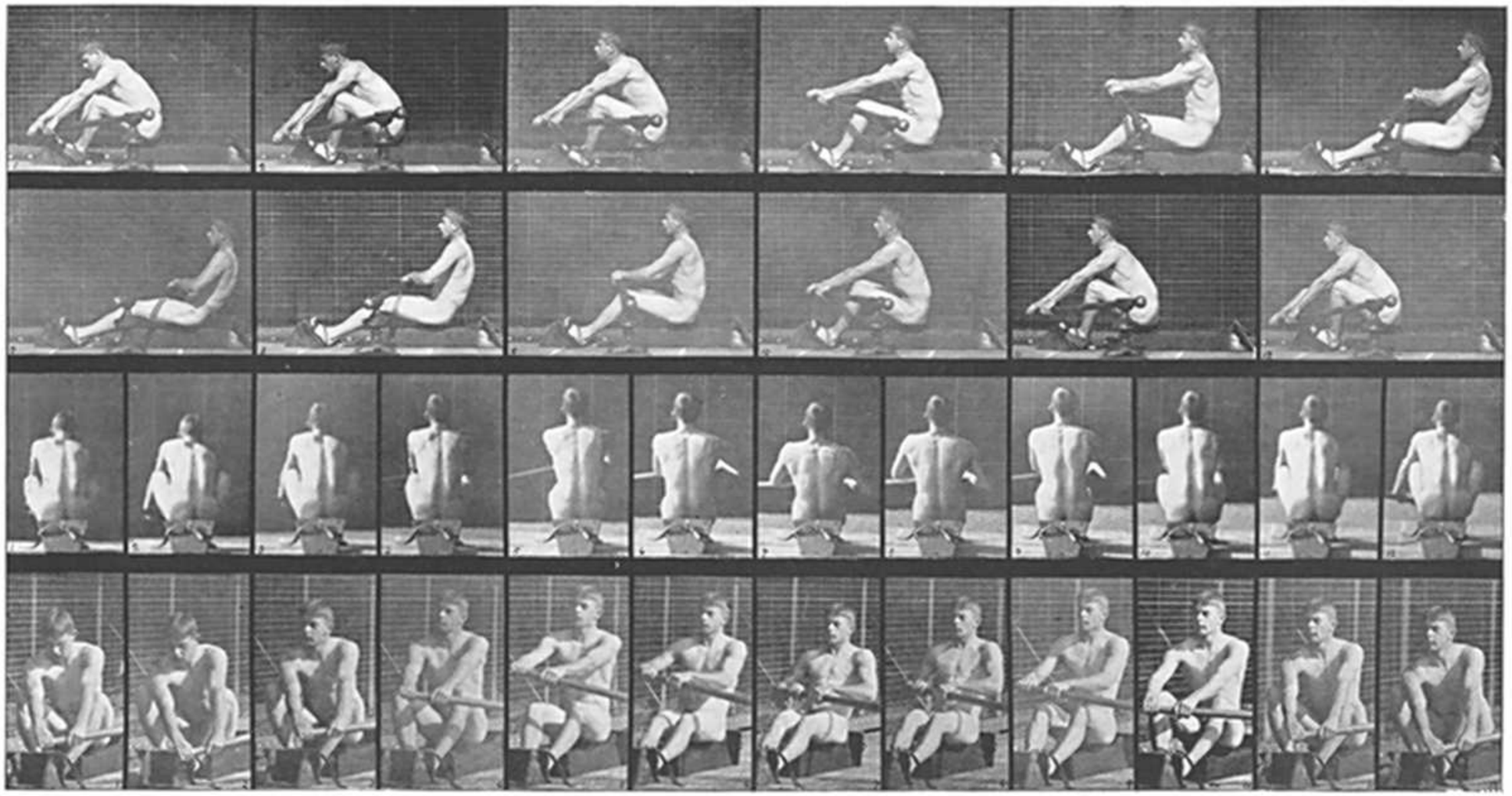
Copyright, 1887, by Eadweard Muybridge.]

← SERIES 28.

ATHLETE. BATTING AT CRICKET.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 69.



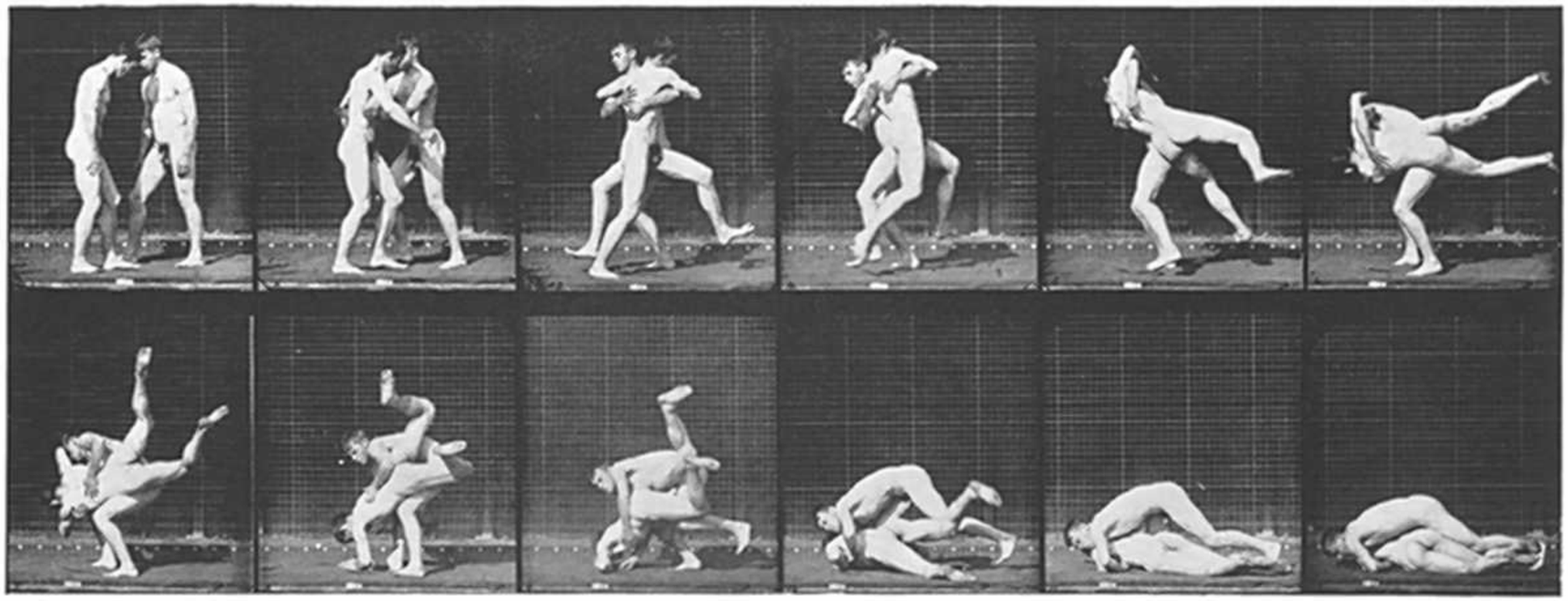
Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 29.

ATHLETE. ROWING.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 68.



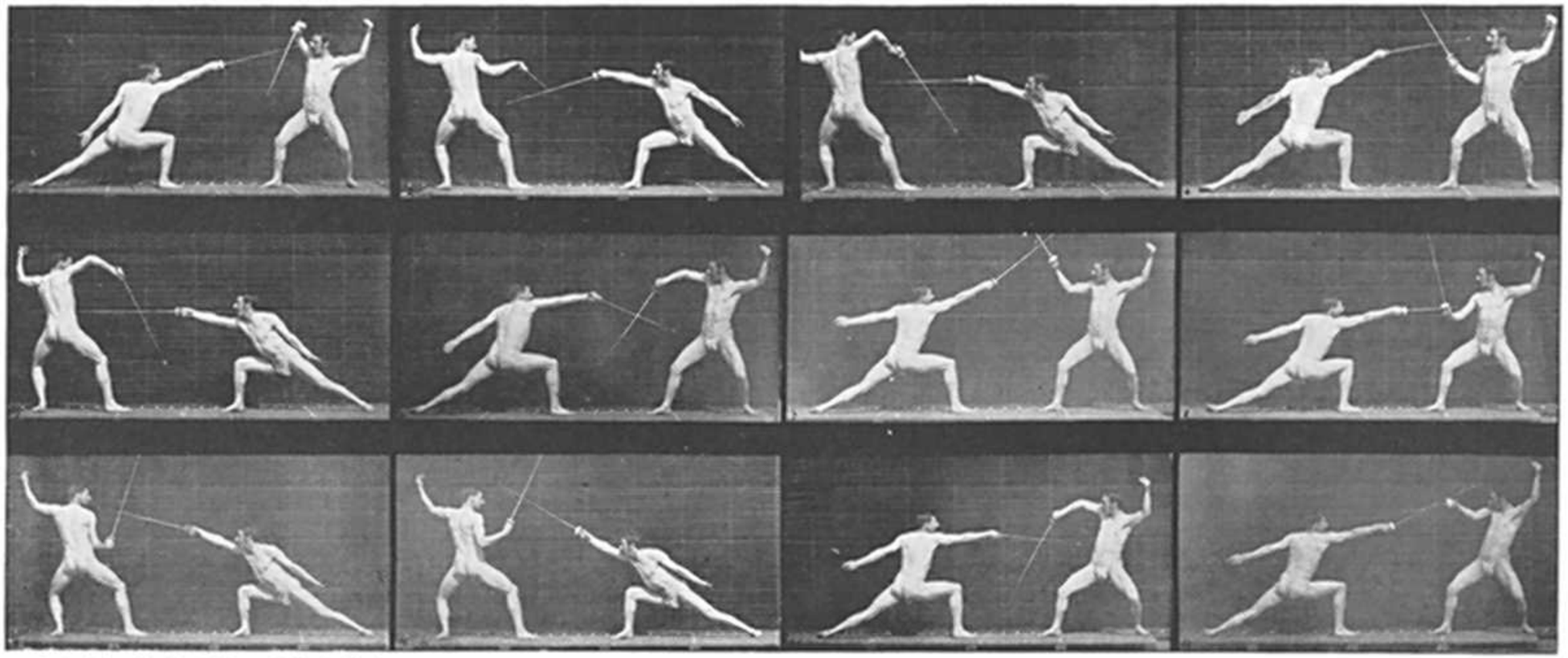
Copyright, 1887, by Eadweard Muybridge.]

SERIES 30.

ATHLETES. WRESTLING.

Models 46 and 68.

For some of these phases, from the original work, see pages 215 and 217.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 31.

ATHLETES. FENCING.

Models 66 and 67.

For some of these phases, from the original work, see page 219.

Copyright, 1887, by Eadweard Muybridge.]

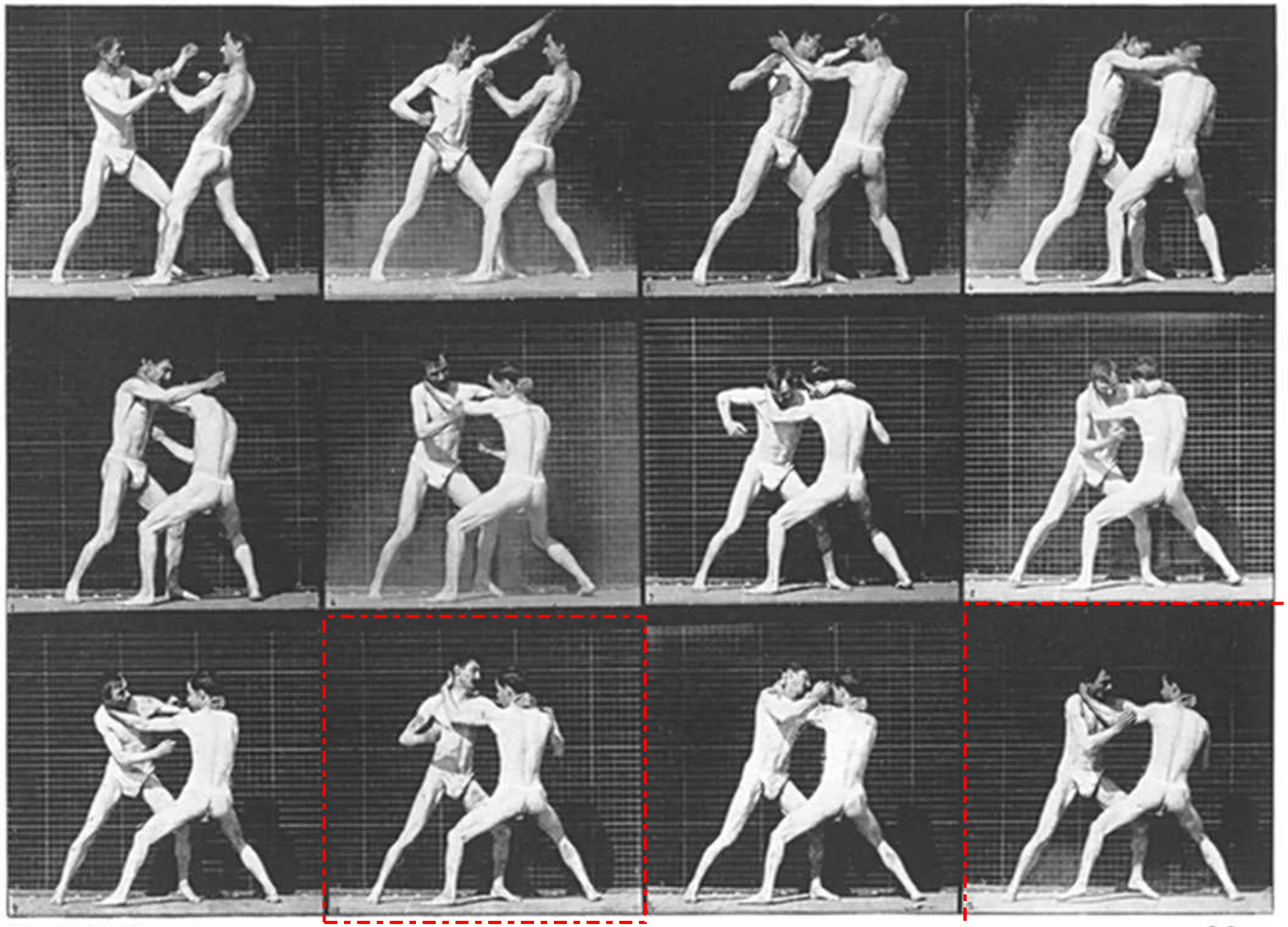
SERIES 32.

PUGILIST. STRIKING A BLOW.

Model 22.

Time-intervals : ·112 second.

For some of these phases, from the original work, see page 221.

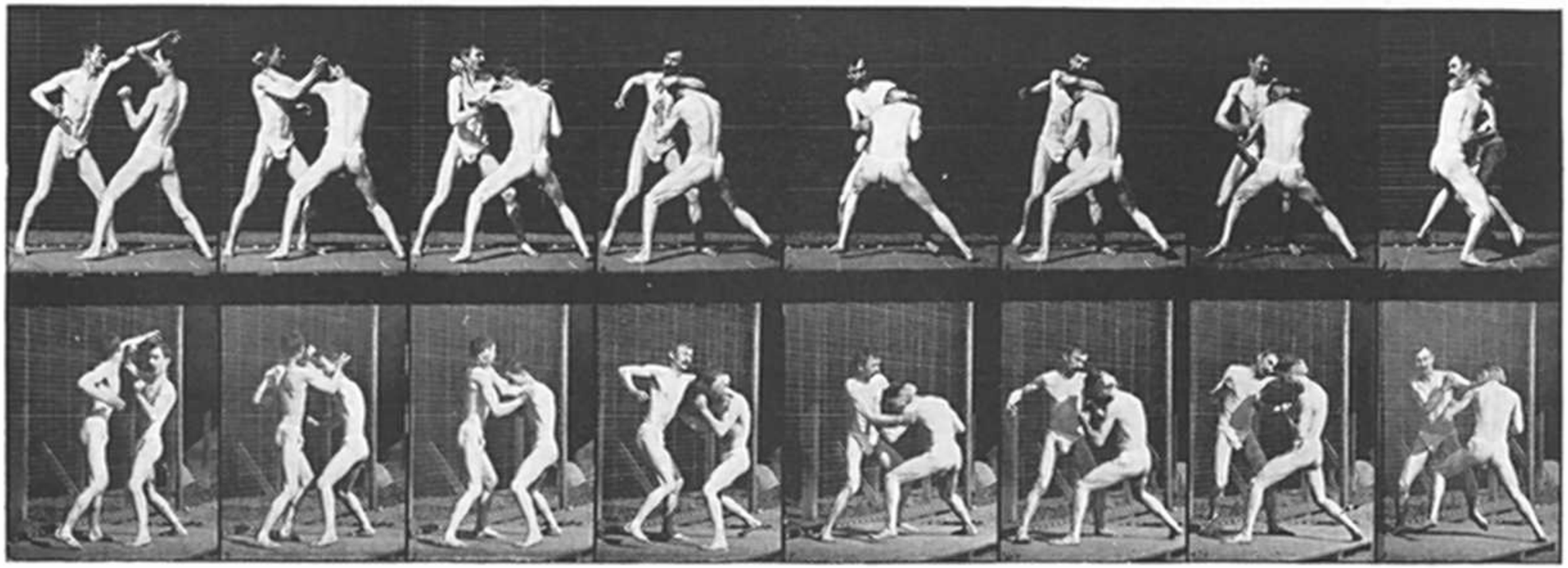


Copyright, 1887, by Eadweard Muybridge.]

SERIES 33.

PUGILISTS. BOXING.

Models 64 and 65.



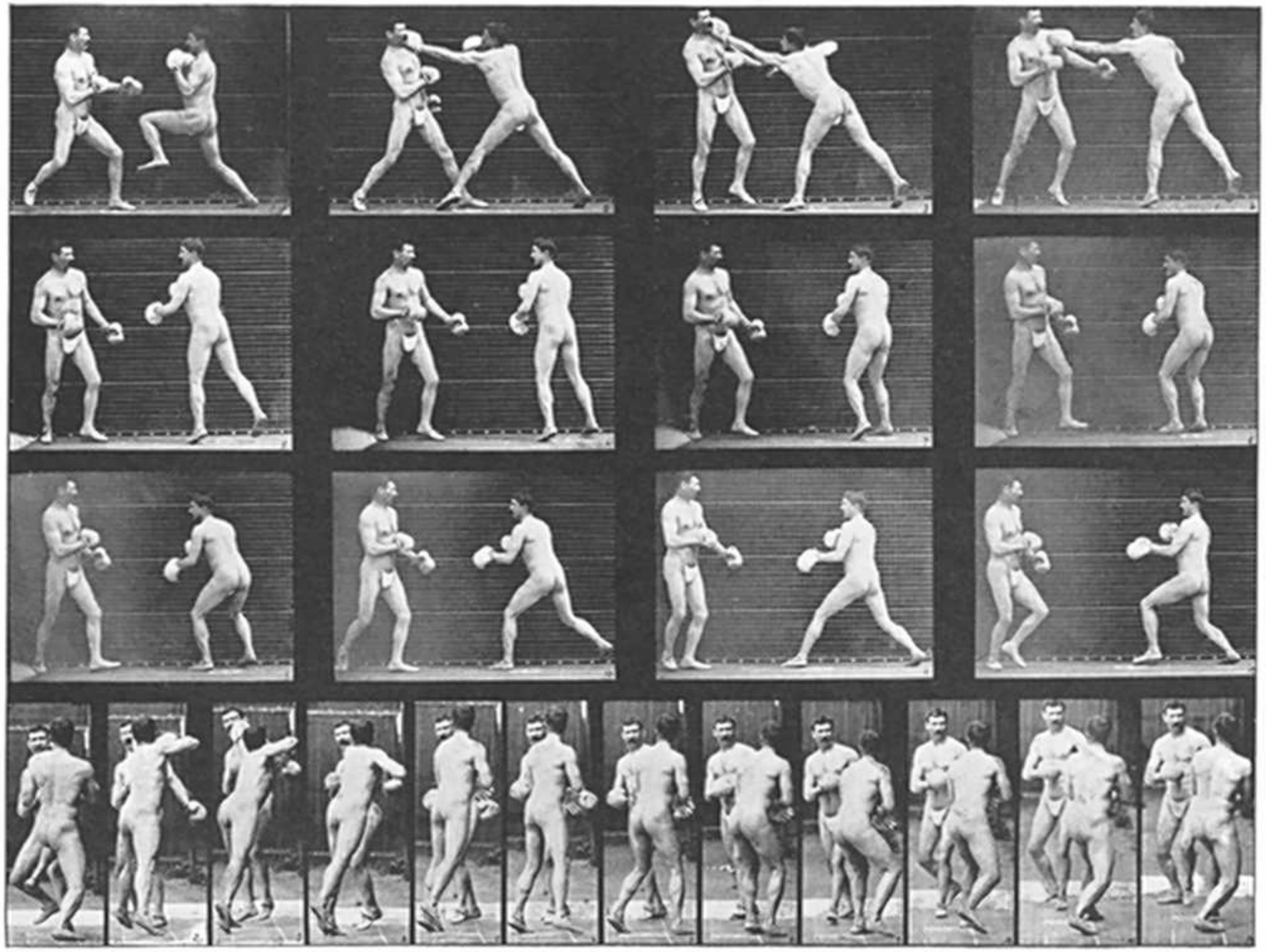
Copyright, 1887, by Eadweard Muybridge.]

SERIES 34.

PUGILISTS. BOXING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Models 64 and 65.



Copyright, 1887, by Eadweard Muybridge.]

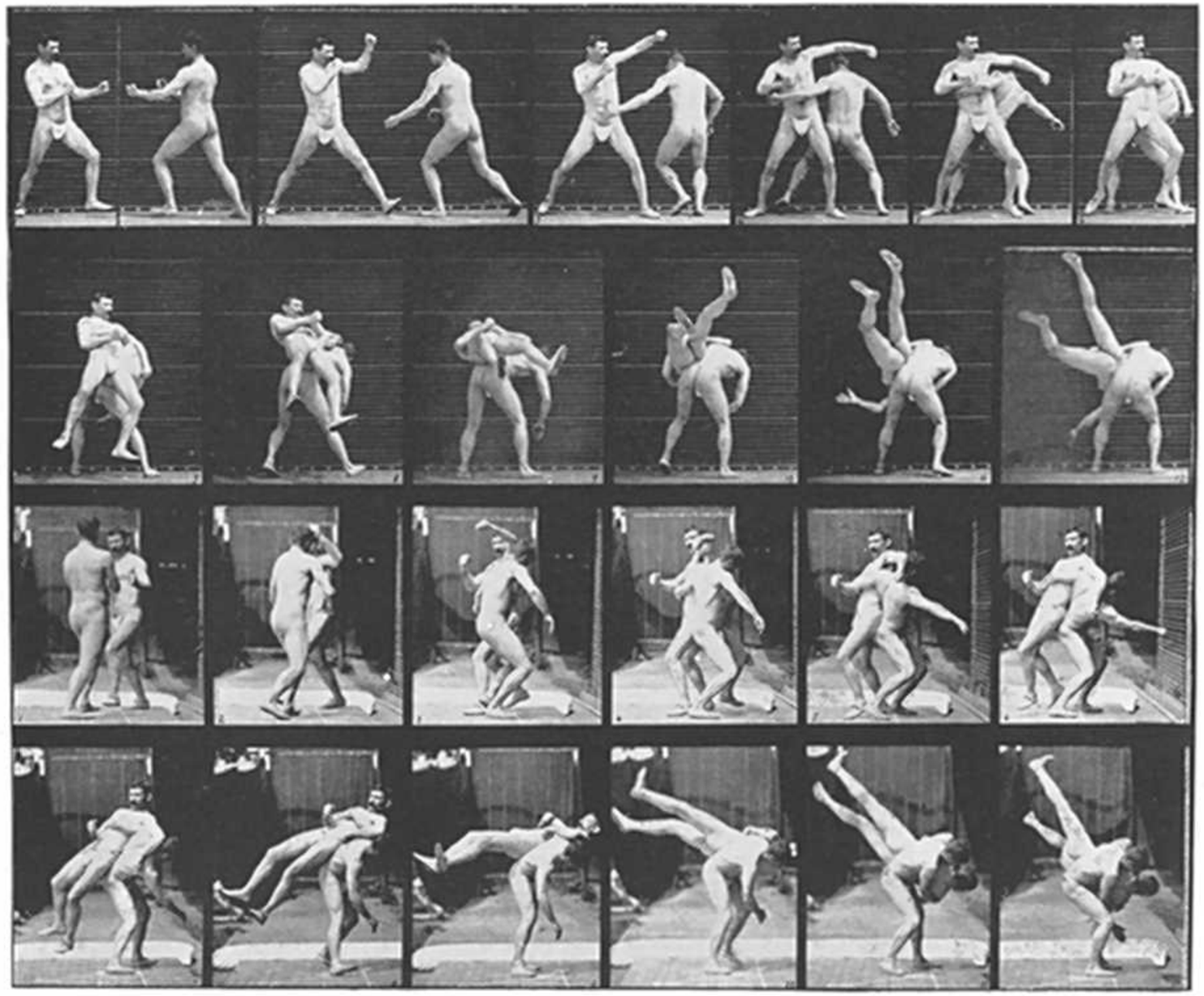
SERIES 35.

PUGILISTS. BOXING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Models 52 and 53. Time-intervals: ·115 second.

For some phases of boxing by these pugilists, from the original work, see pages 221 and 223.



Copyright, 1887, by Eadweard Muybridge.]

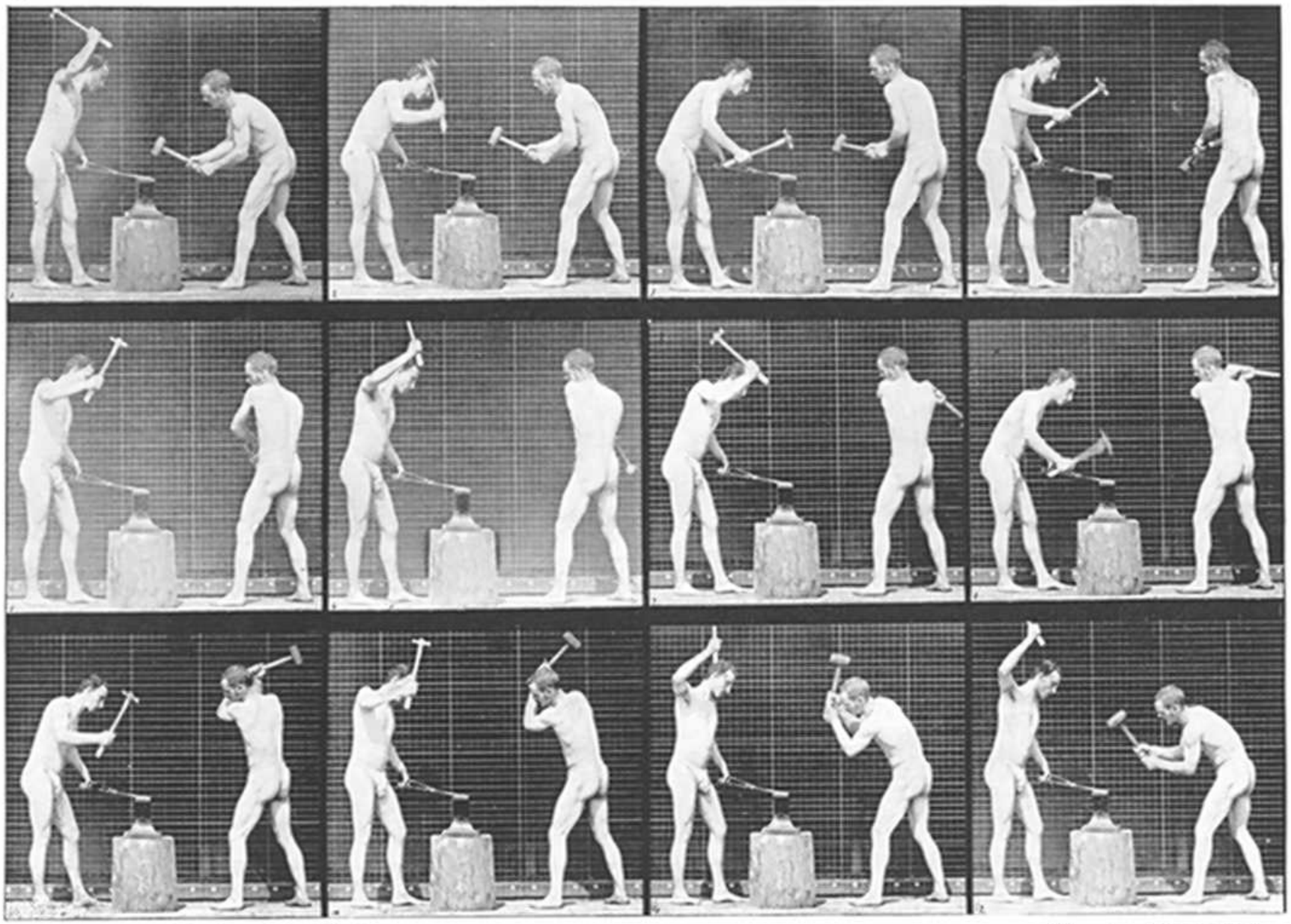
SERIES 36.

PUGILISTS. BOXING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Models 52 and 53. Time-intervals ·163 second.

For some phases of boxing by these pugilists, from the original work, see pages 221 and 223.



Copyright, 1887, by Eadweard Muybridge.]

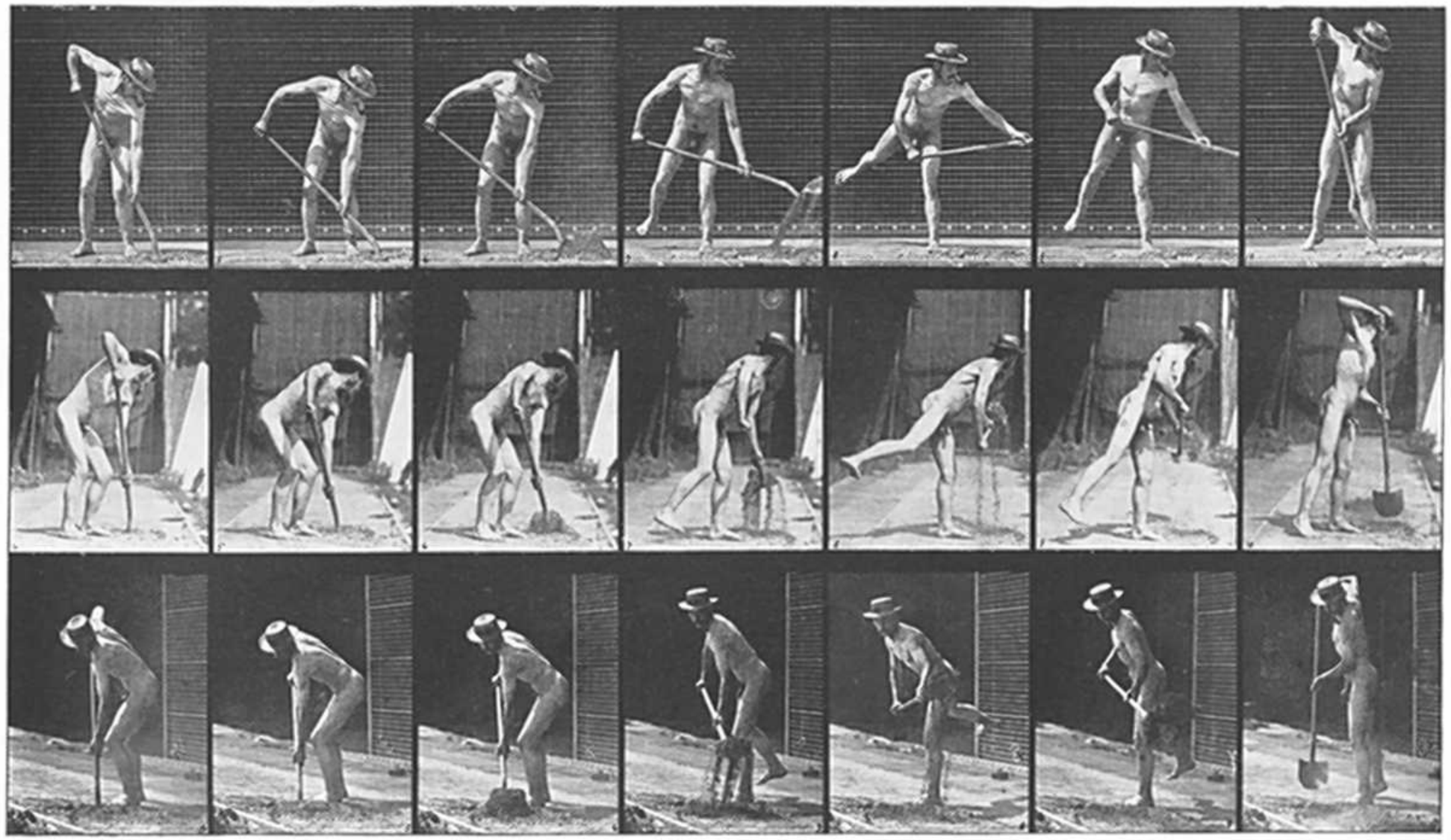
SERIES 37.

BLACKSMITHS. HAMMERING AT AN ANVIL.

Models 59 and 61.

Time-intervals : ·133 second.

For some of these phases, from the original work, see pages 225 and 227.



Copyright, 1887, by Eadweard Muybridge.]

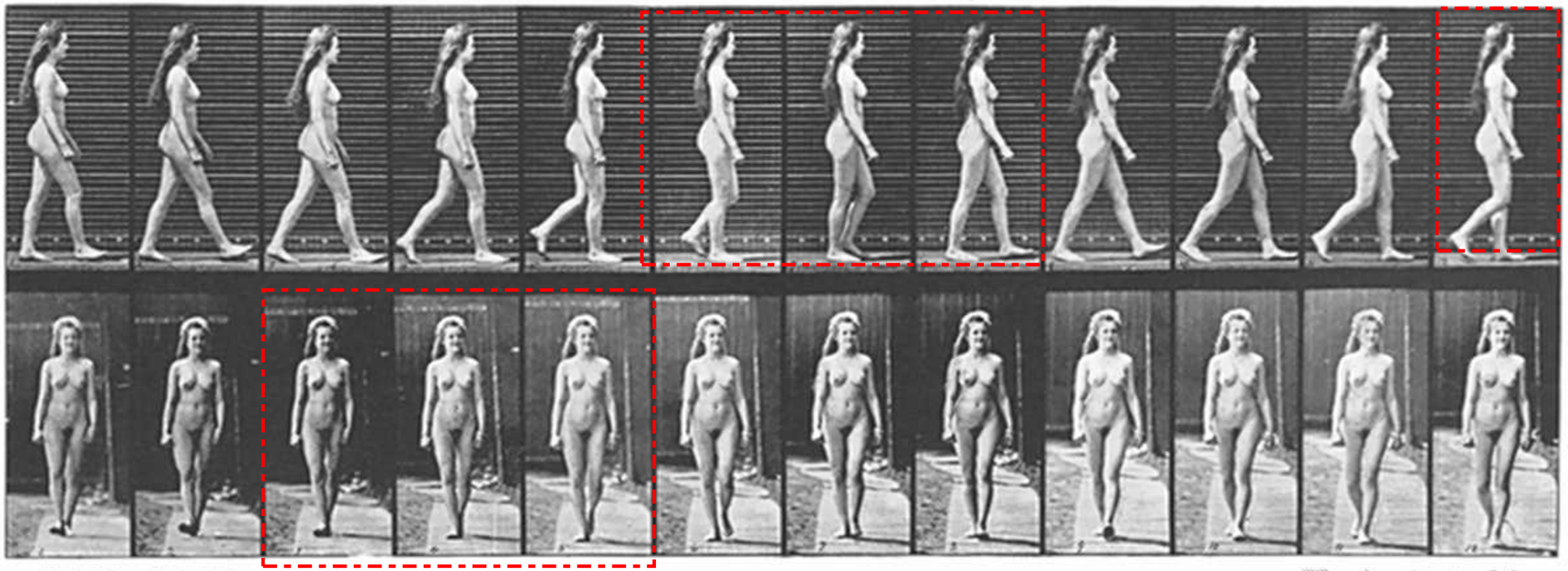
SERIES 38.

LABOURER WITH LONG-HANDLED SHOVEL.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 41.

Time-intervals : ·334 second.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 39.

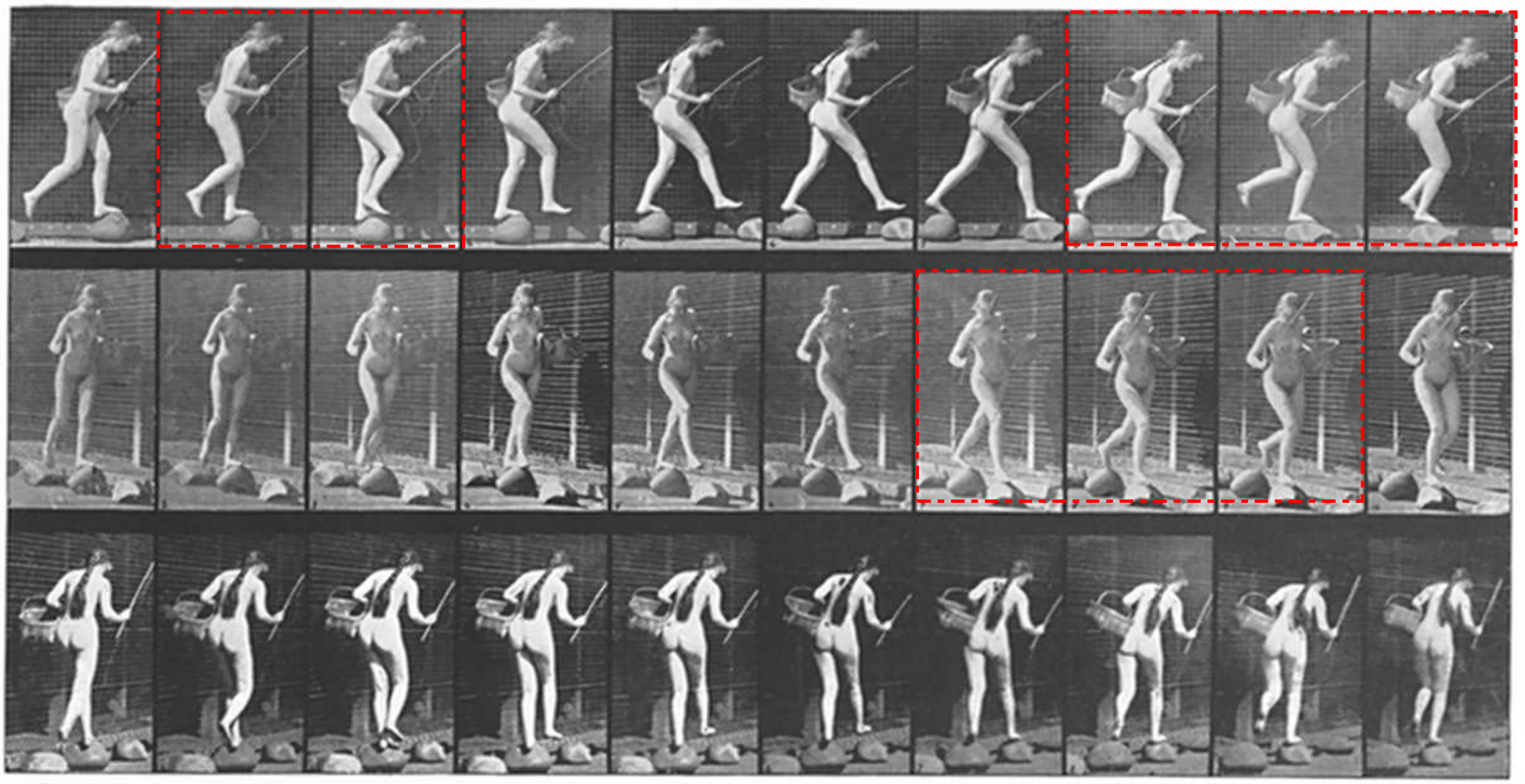
WOMAN. WALKING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 6.

Time-intervals : ·094 second.

For some of these phases, from the original work, see page 231.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 40.

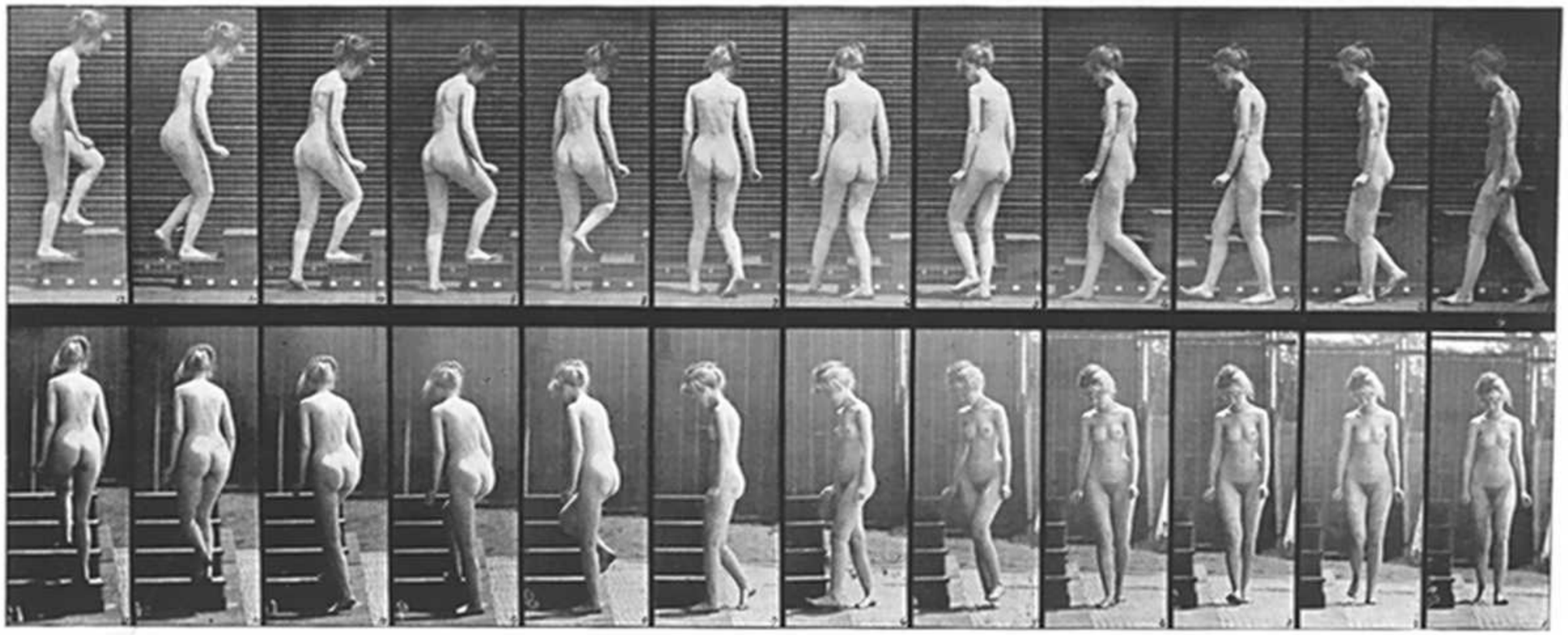
WOMAN. CROSSING ON "STEP-STONES."

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 7.

Time-intervals : ·118 second.

For some of these phases, from the original work, see page 231.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 41.

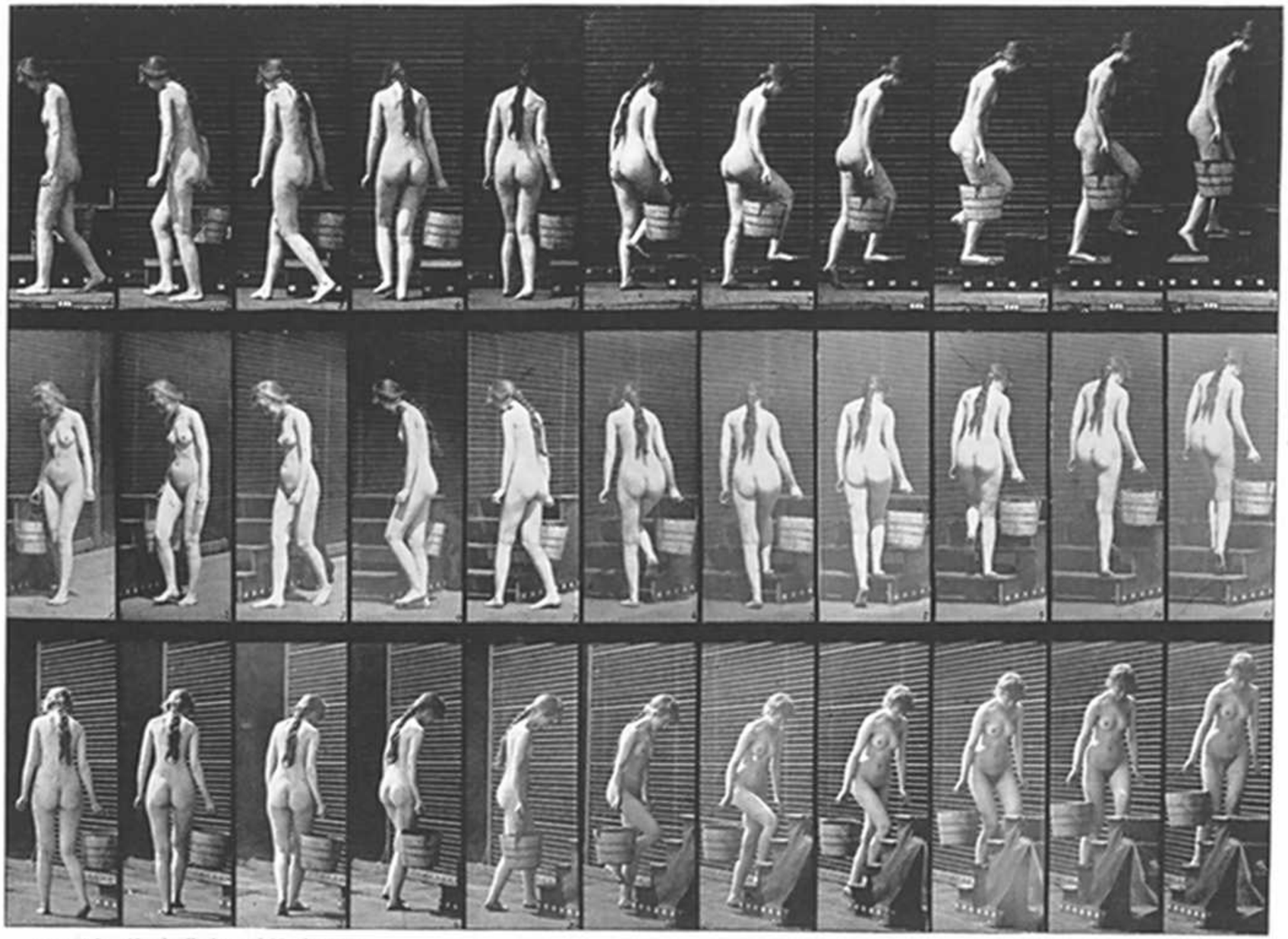
WOMAN. TURNING, AND ASCENDING STAIRWAY.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 7.

Time-intervals : ·284 second.

For some of these phases, from the original work, see page 233.



Copyright, 1887, by Eadweard Muybridge.]

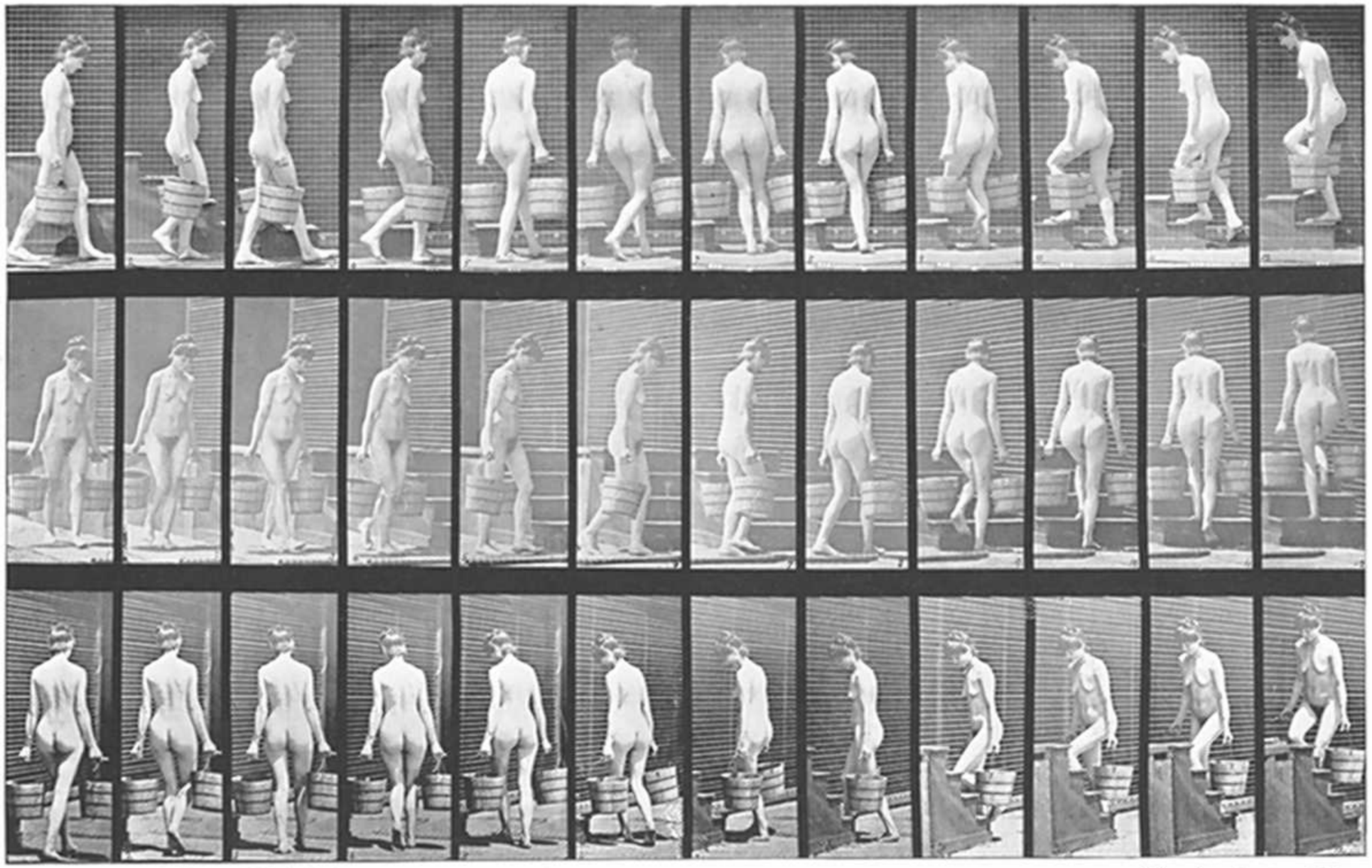
SERIES 42.

WOMAN. WITH A BUCKET OF WATER IN ONE HAND, ASCENDING STAIRS.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 7. Time-intervals : ·325 second.

For some of these phases, from the original work, see page 235.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 43.

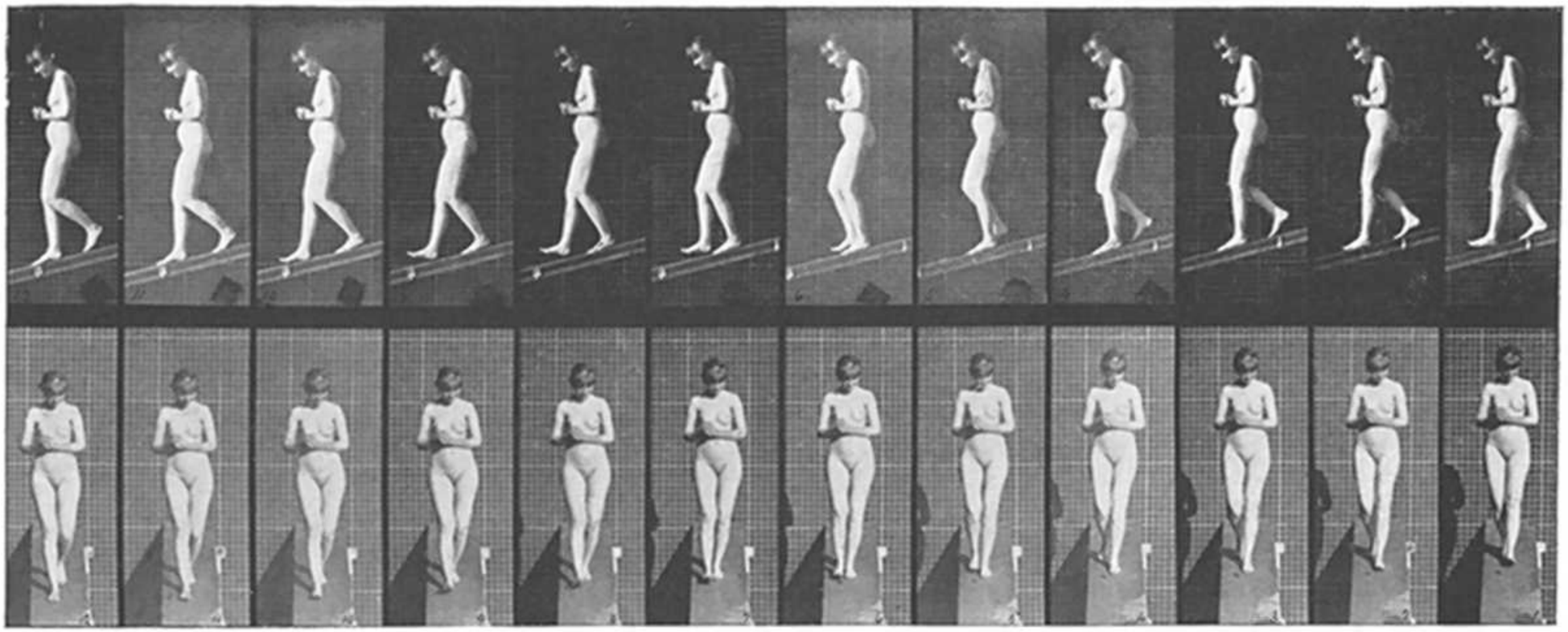
WOMAN. WITH A BUCKET OF WATER IN EACH HAND, ASCENDING STAIRS.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 4.

Time-intervals : ·266 second.

For some of these phases, from the original work, see page 235.



Copyright, 1887, by Eadweard Muybridge.]

← SERIES 44.

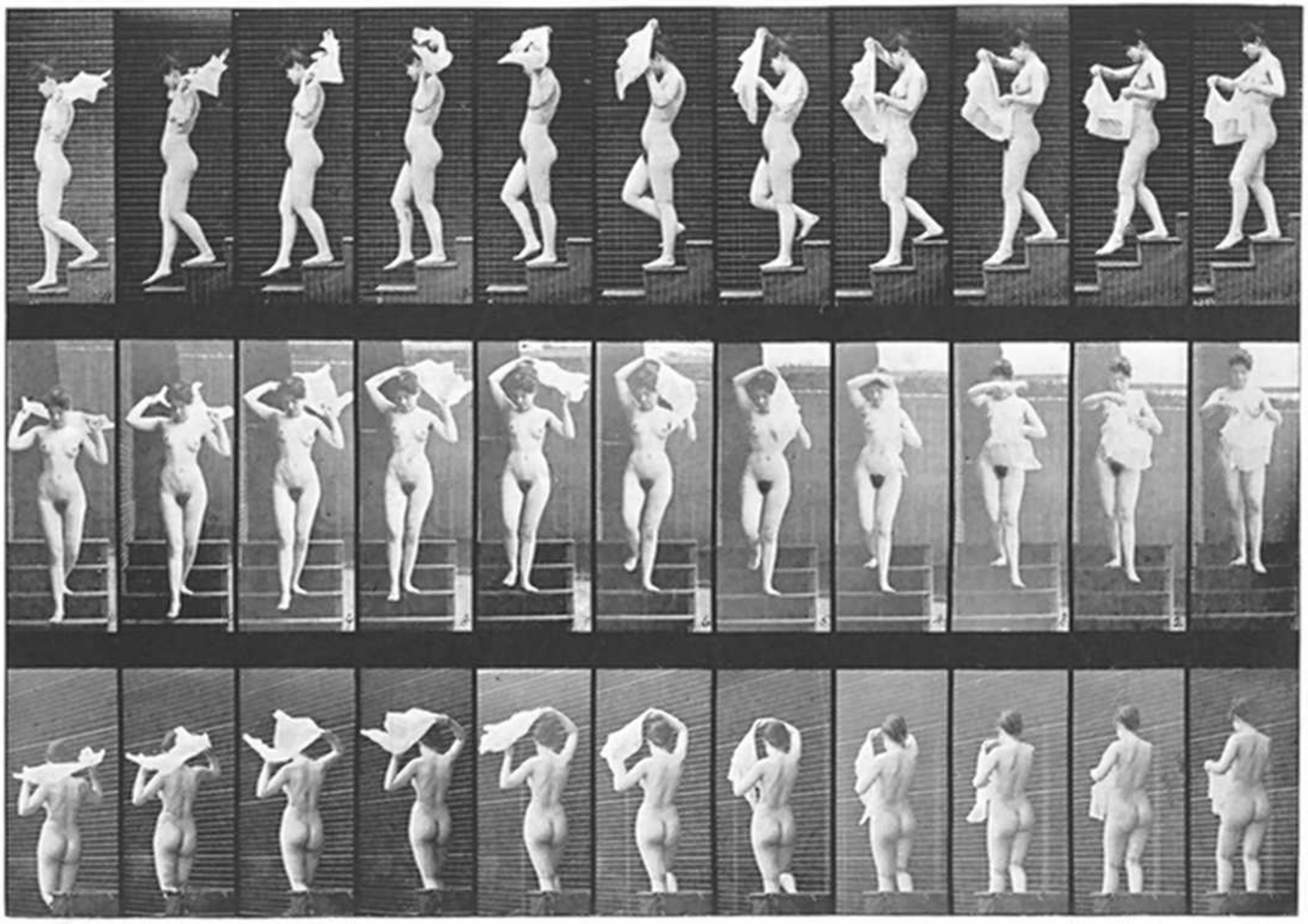
WOMAN. DESCENDING AN INCLINE.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 7.

Time-intervals : ·090 second.

For some of these phases, from the original work, see page 229.



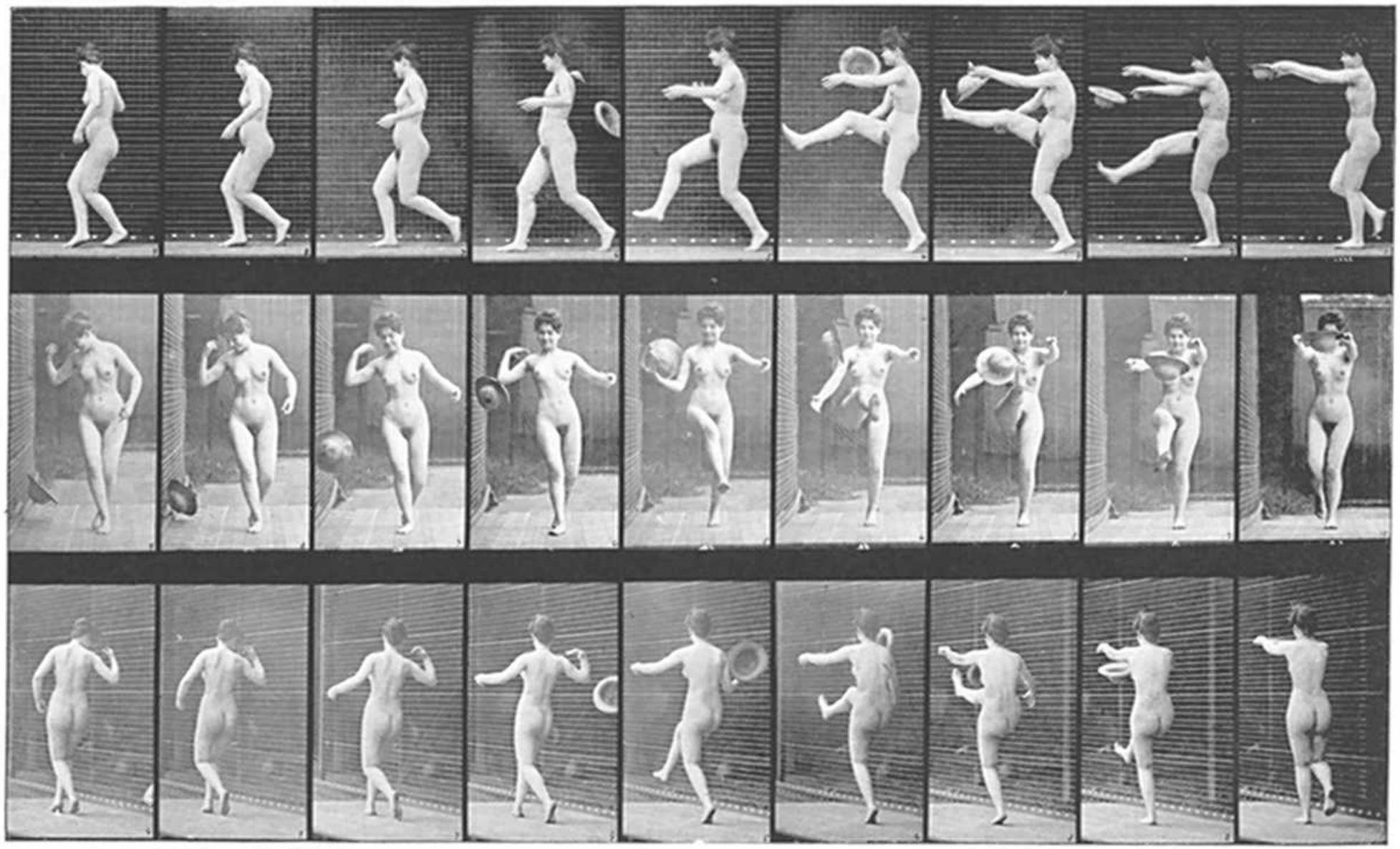
Copyright, 1887, by Eadweard Muybridge.]

← SERIES 45.

WOMAN. DESCENDING A STAIRWAY.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 13. Time-intervals : ·101 second.



Copyright, 1887, by Eadweard Muybridge.]

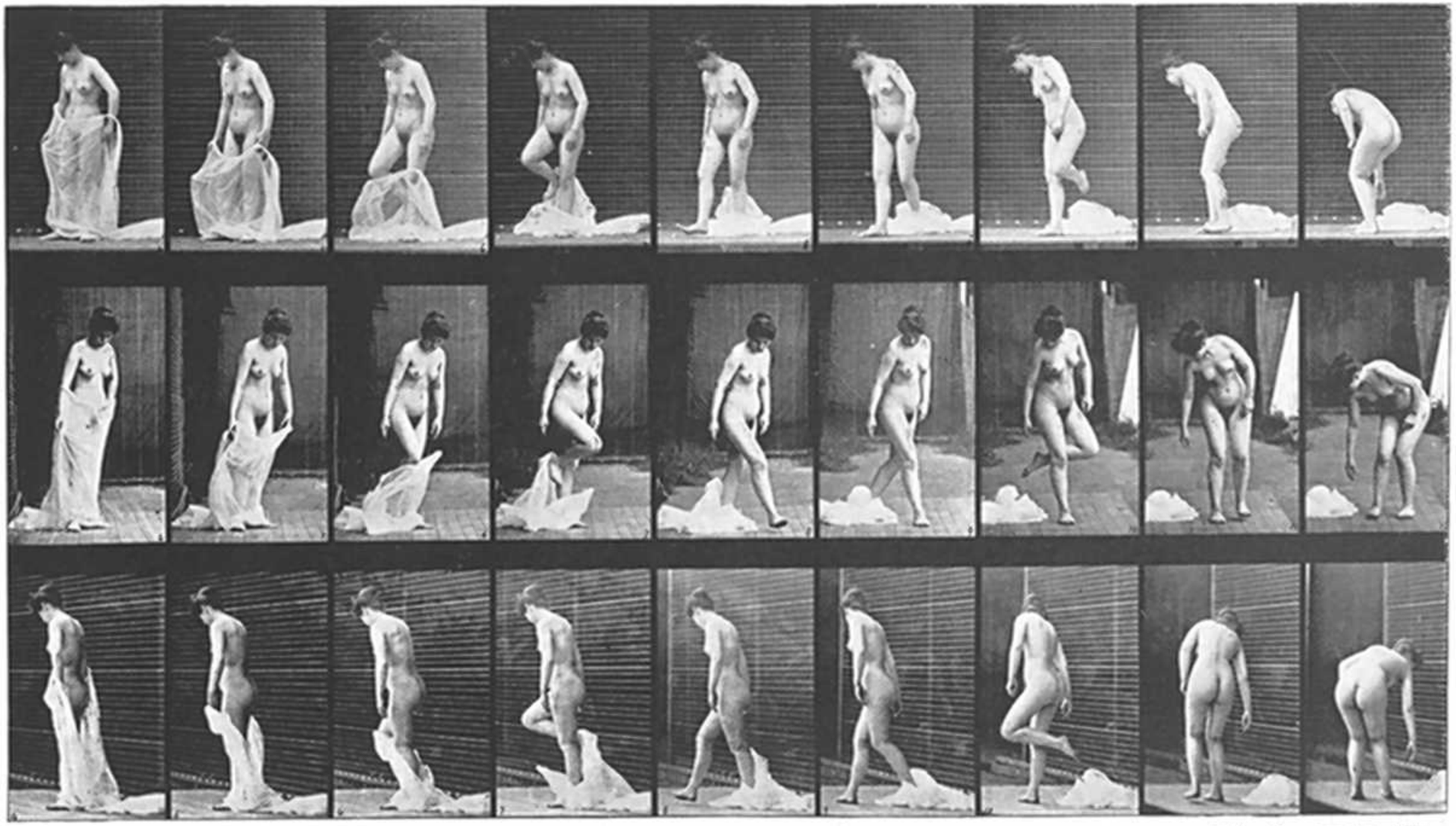
← SERIES 46.

WOMAN. KICKING.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 13.

Time-intervals : ·169 second.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 47.

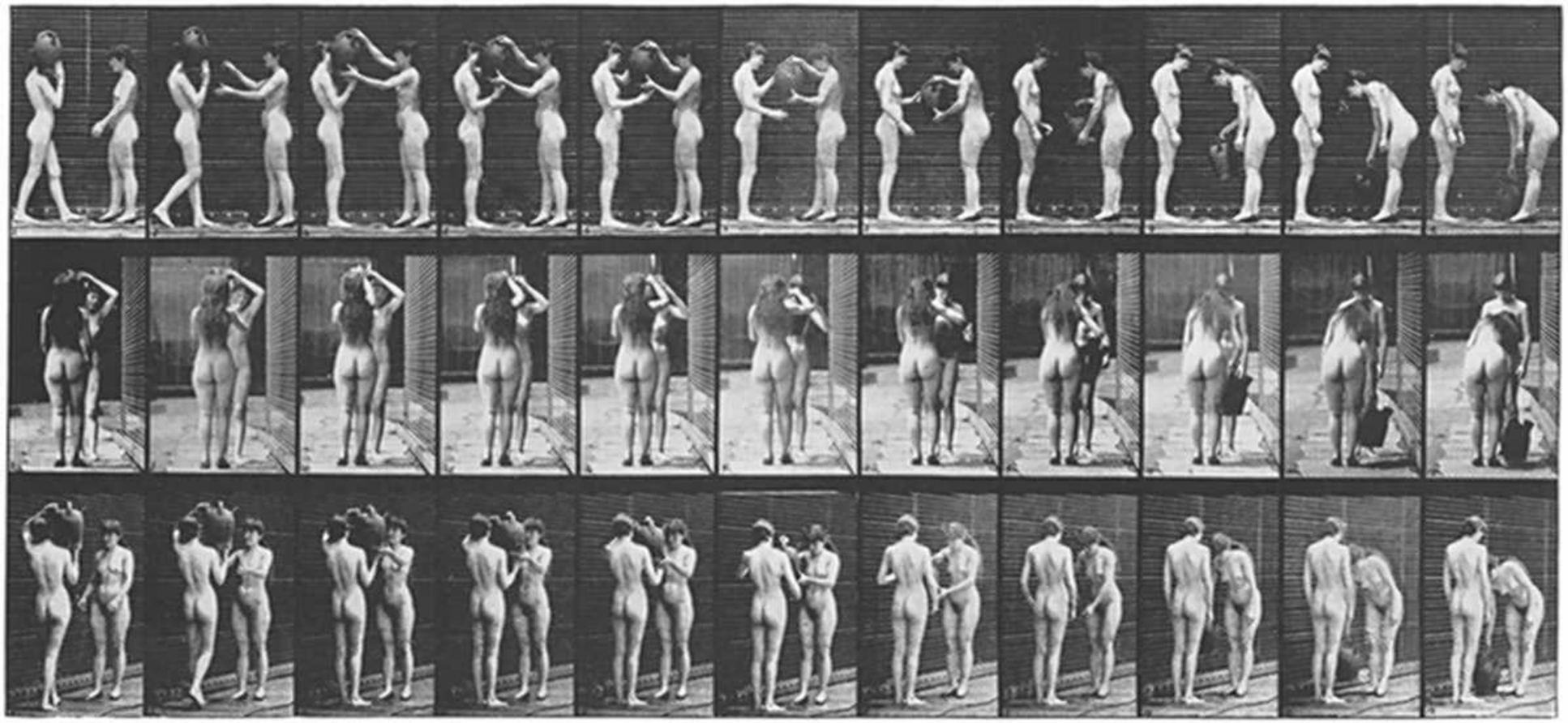
WOMAN. REMOVING MANTLE.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 13.

Time-intervals : ·274 second.

For a phase of this series, from the original work, see page 231.



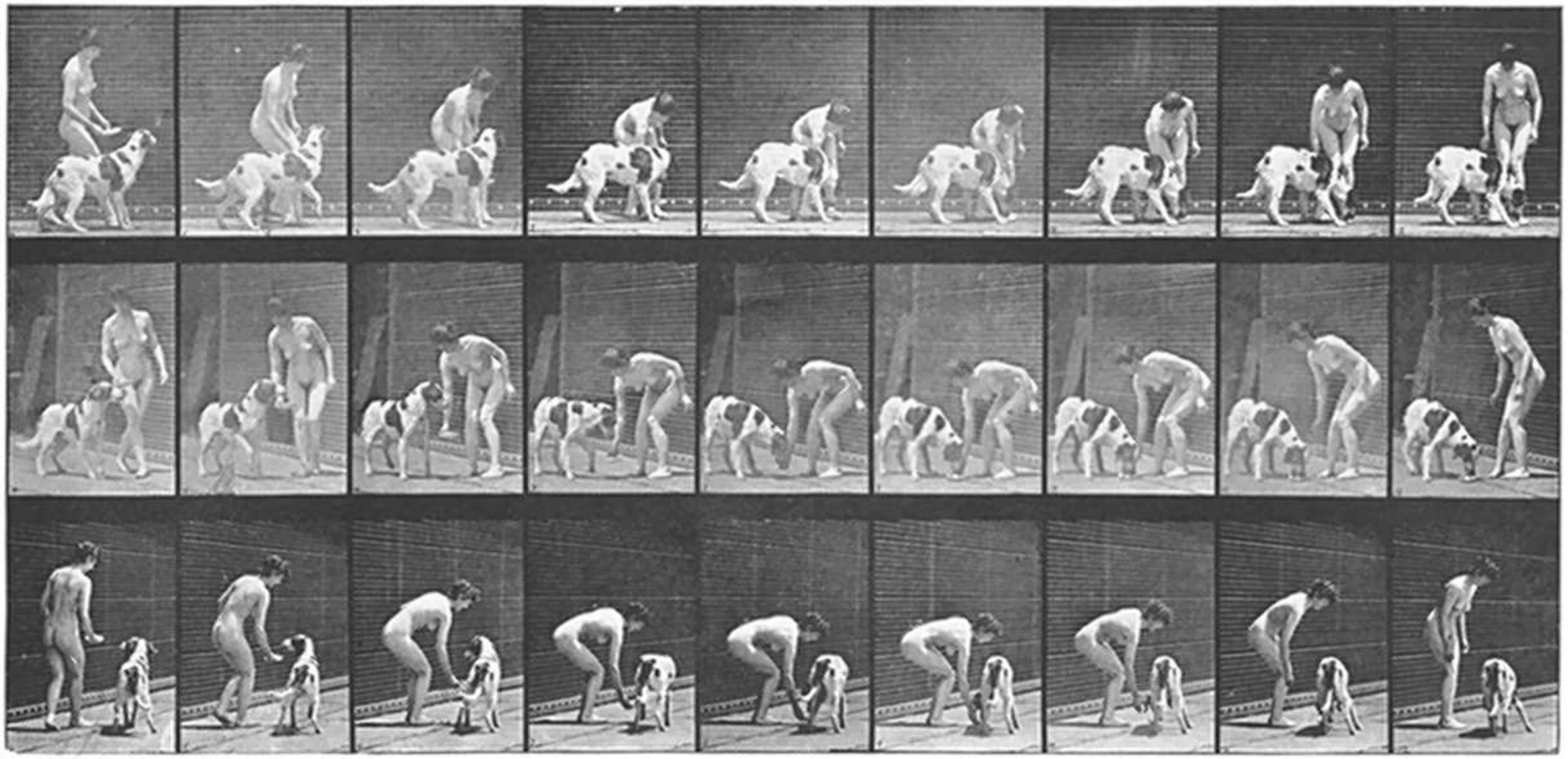
Copyright, 1887, by Eadweard Muybridge.]

SERIES 48.

WOMAN. TAKING WATER-JAR FROM ANOTHER WOMAN.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Models 9 and 10. Time-intervals : ·260 second.



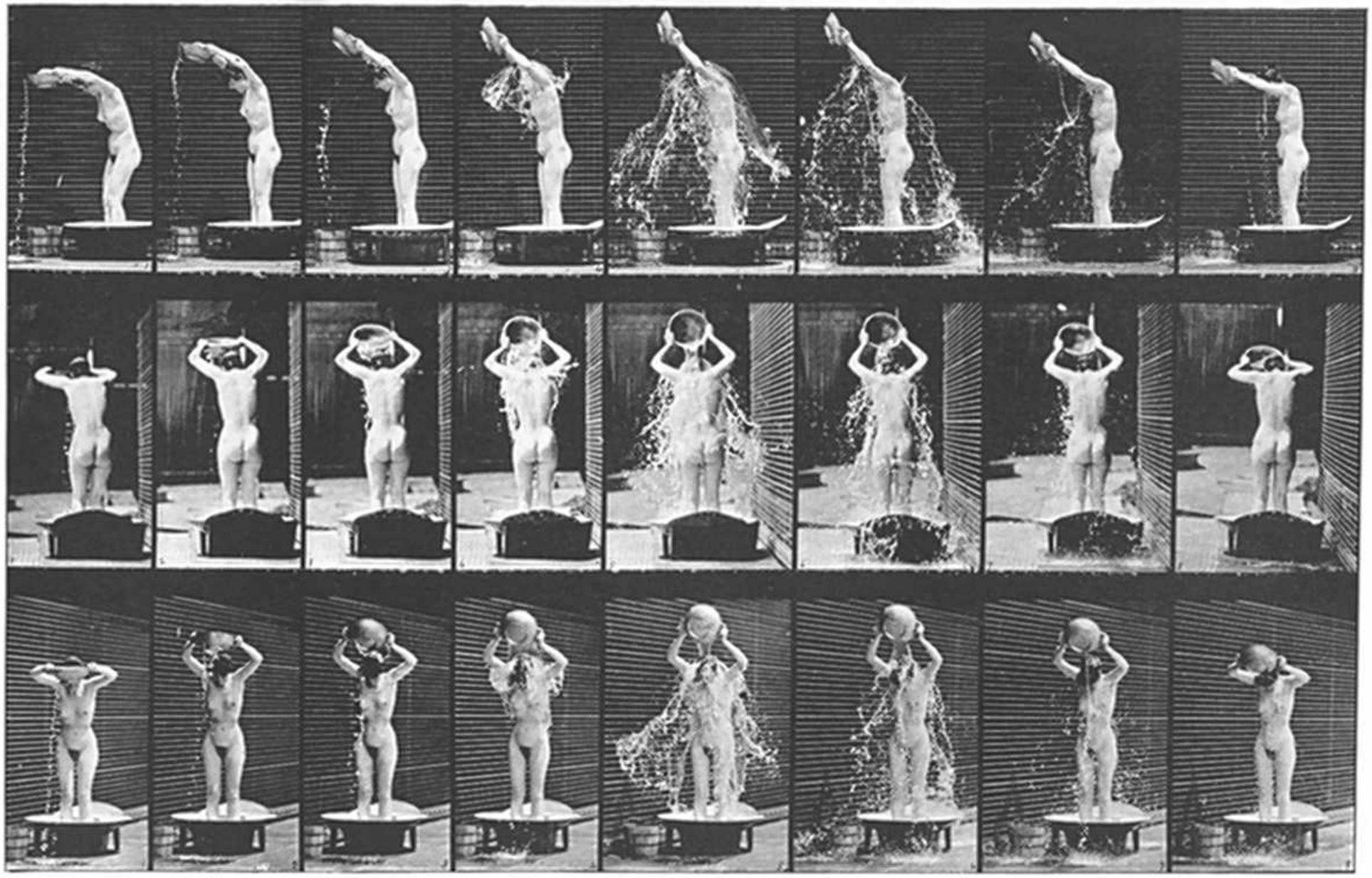
Copyright, 1887, by Eadweard Muybridge.]

SERIES 49.

WOMAN. FEEDING A DOG.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 8. Time-intervals: ·222 second.



Copyright, 1887, by Eadweard Muybridge.]

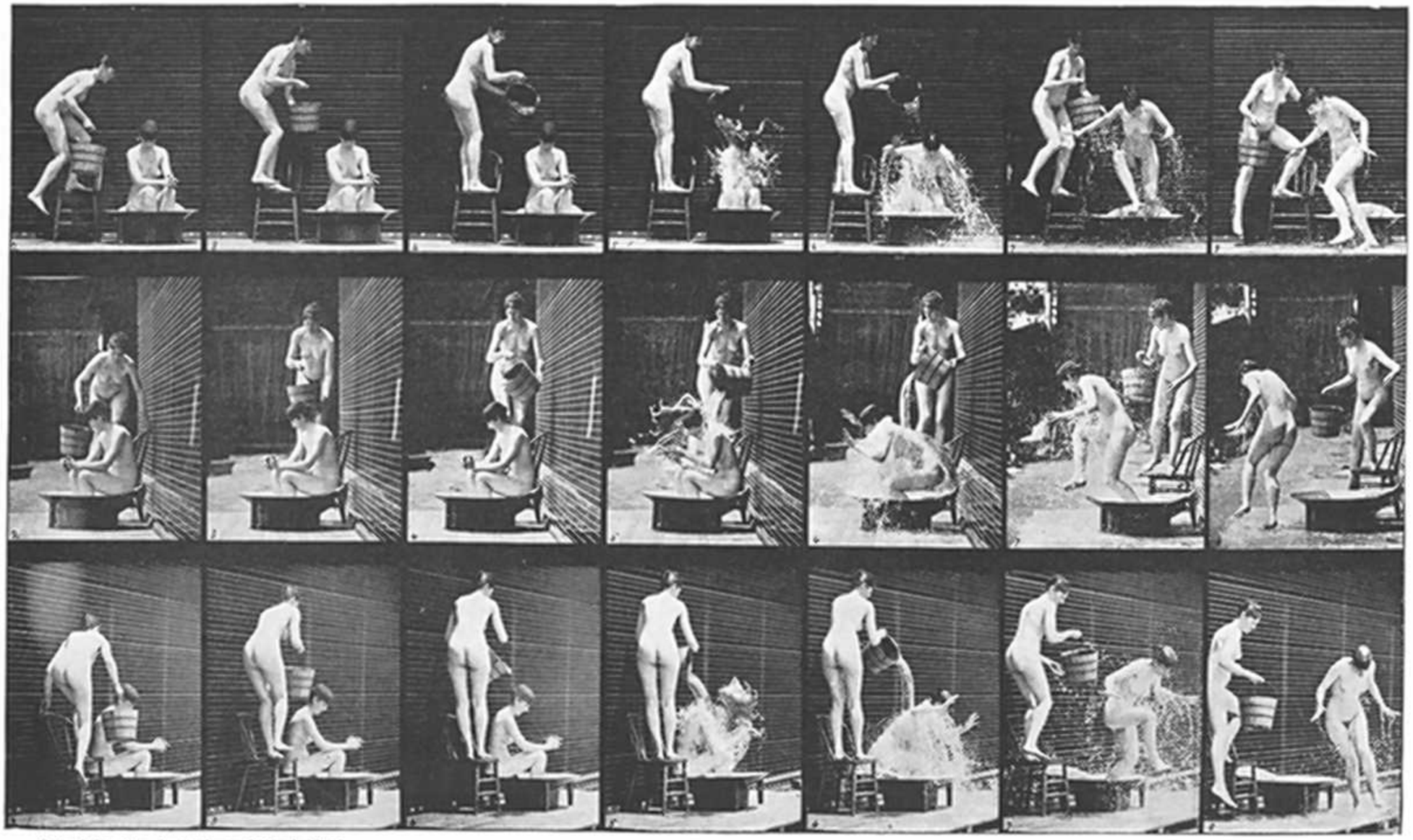
SERIES 50.

WOMAN. POURING A BASIN OF WATER OVER HER HEAD.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model S. Time-intervals : ·244 second.

For some of these phases, from the original work, see page 241.



Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 51.

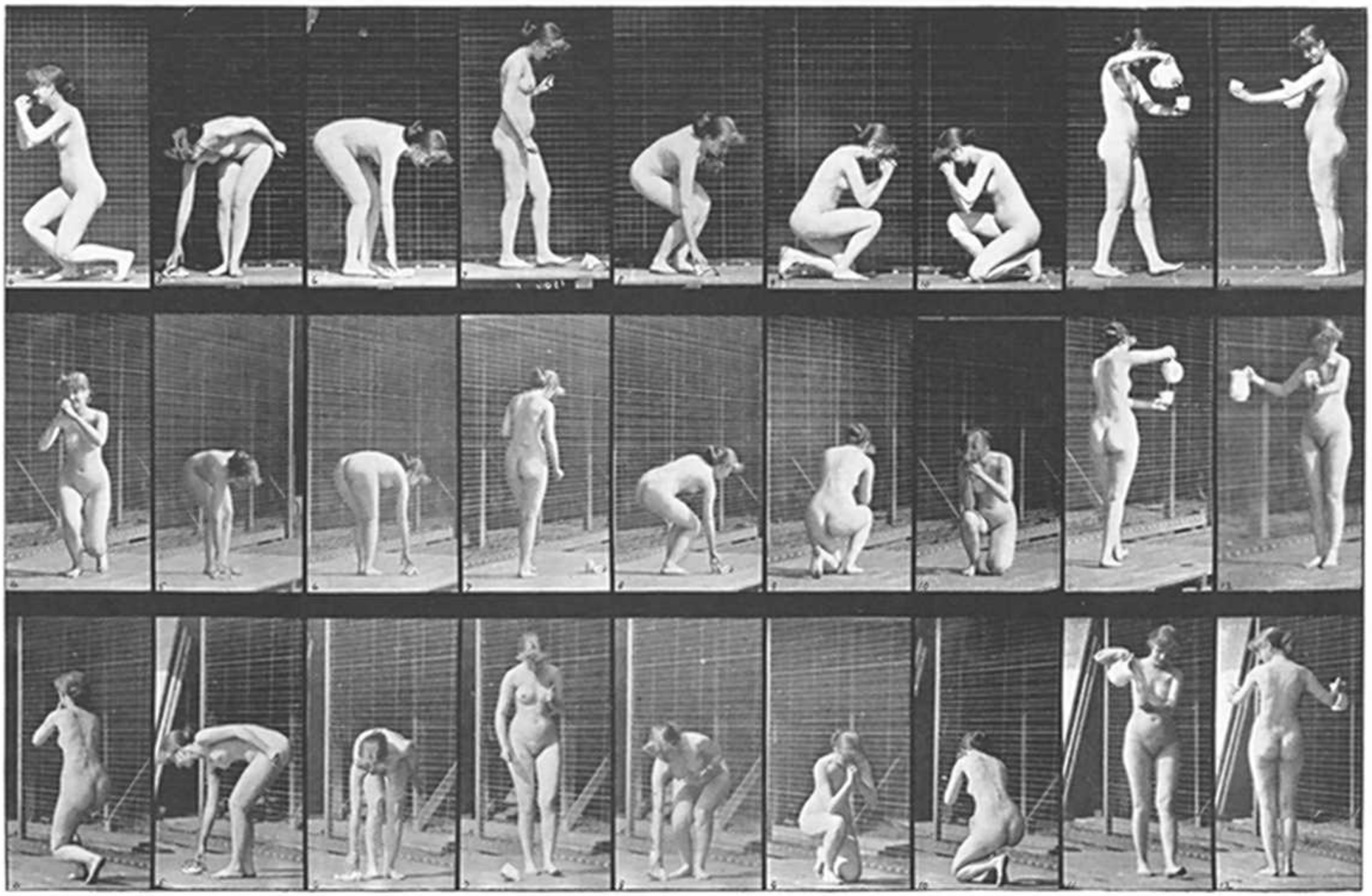
WOMAN. A SHOCK TO THE NERVOUS SYSTEM.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Models 1 and 8.

Time-intervals: ·437 second.

For a phase of this series, from the original work, see page 241.



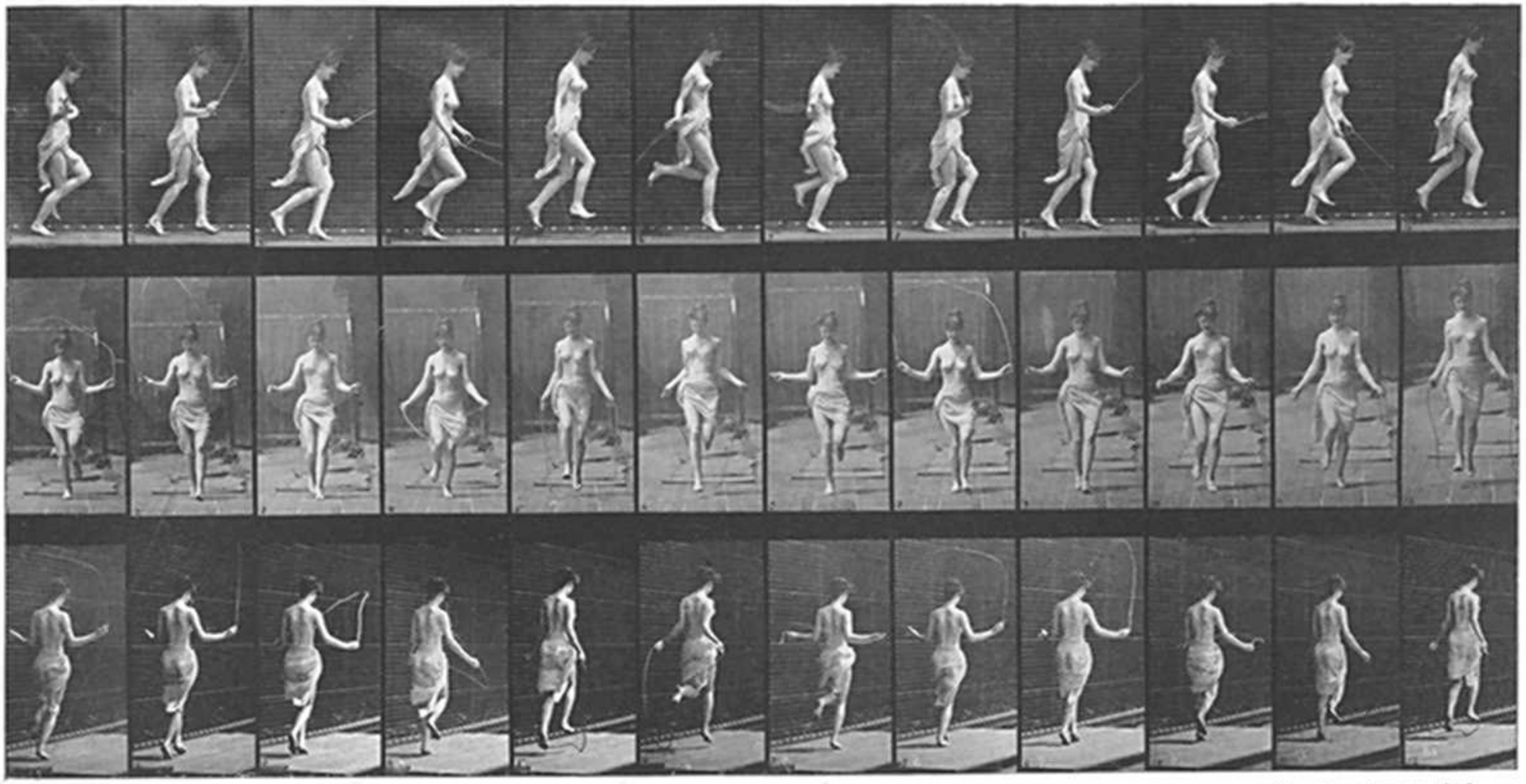
Copyright, 1887, by Eadweard Muybridge.]

SERIES 52.

VARIOUS INDEPENDENT ACTS OF MOTION.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 7.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 53.

WOMAN. USING SKIPPING-ROPE.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 12.

Time-intervals: ·104 second.

For some of these phases, from the original work, see page 243.

Copyright, 1887, by Eadweard Muybridge.]

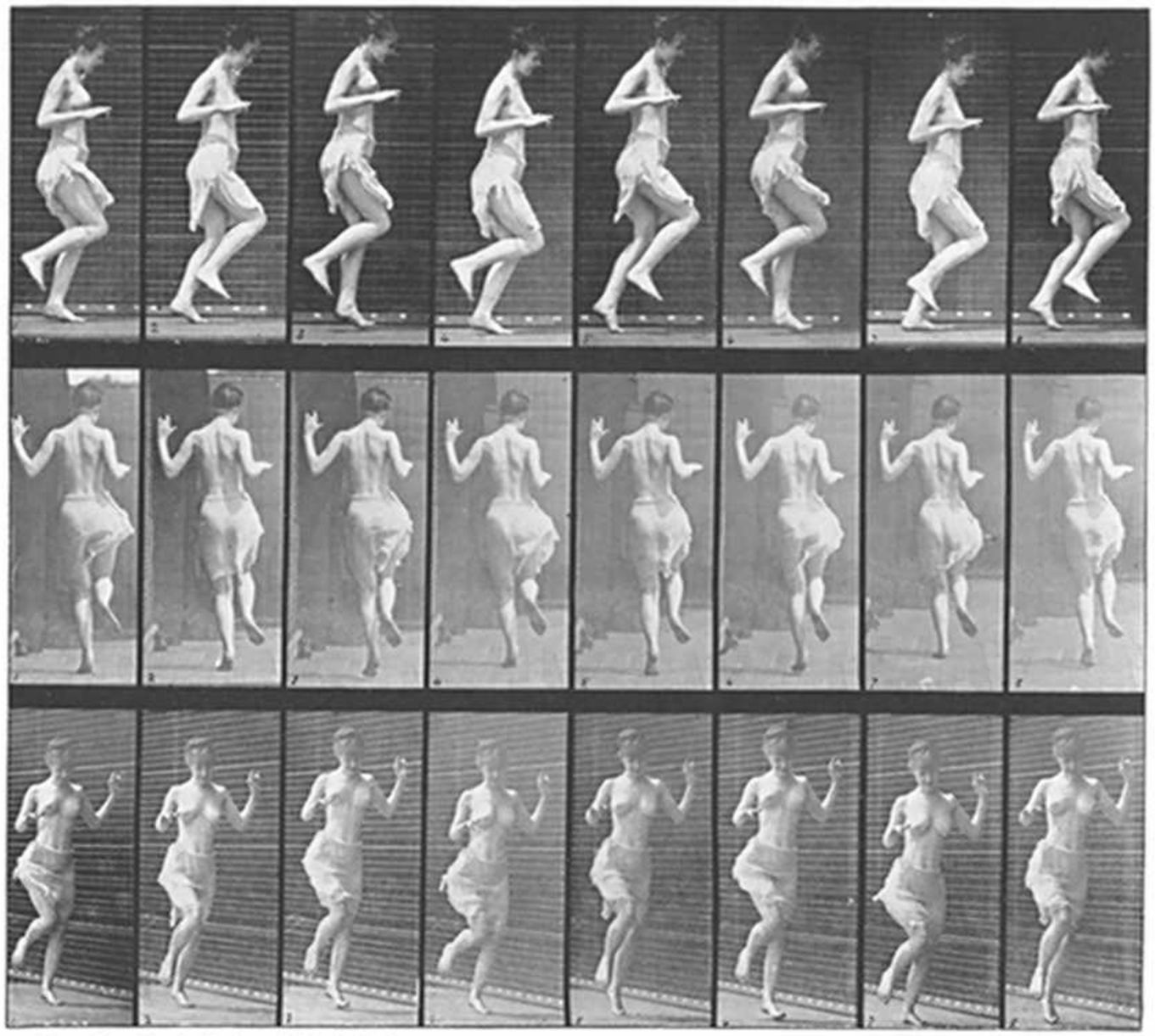
SERIES 54.

WOMAN. JUMPING ON "STEP-STONES."

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 12. Time-intervals : '119 second.

For some of these phases, from the original work, see page 245.



Copyright, 1887, by Eadweard Muybridge.]

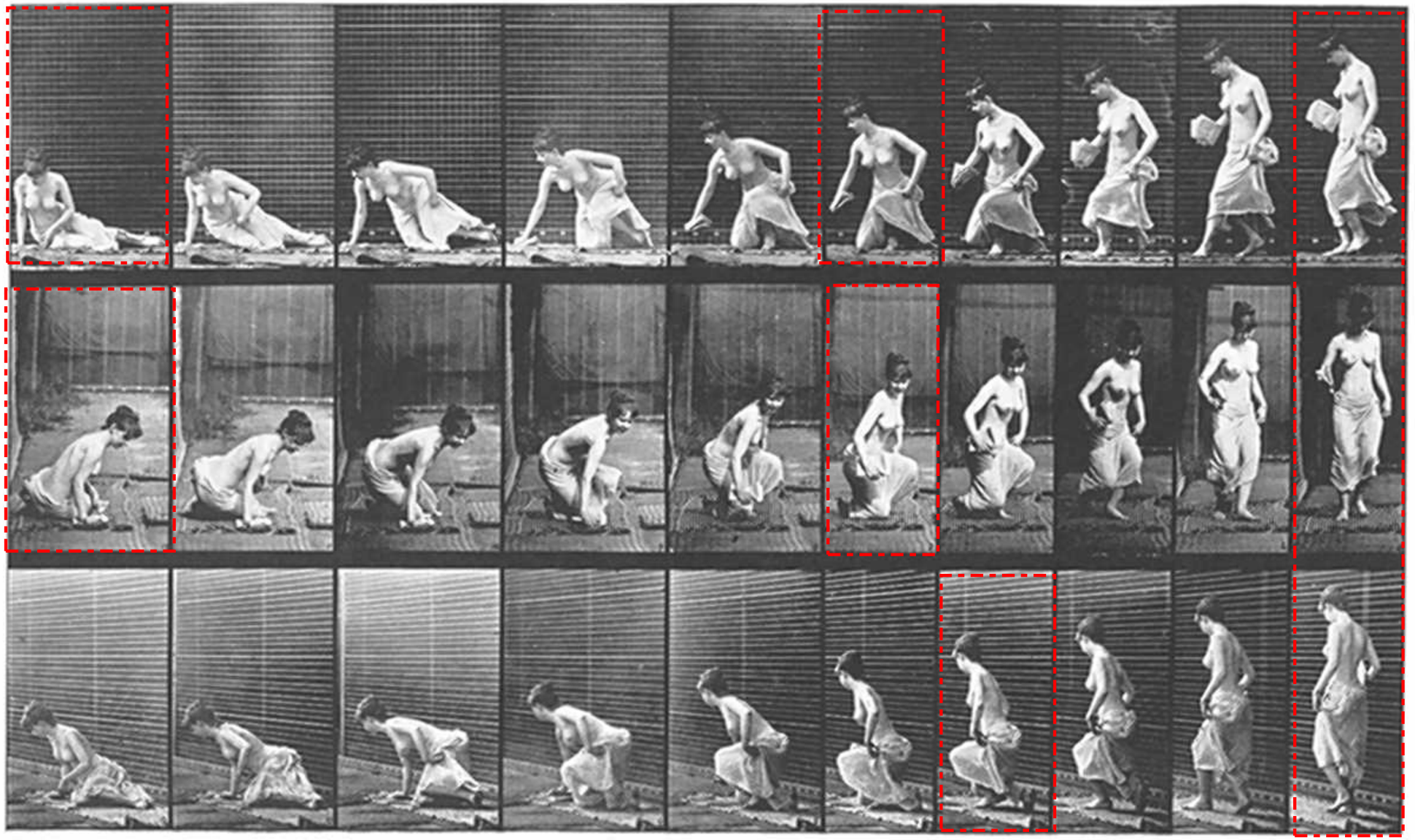
SERIES 55.

WOMAN. RICOCHETTING ON ONE FOOT.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 12. Time-intervals : ·141 second.

For some of these phases, from the original work, see page 245.



Copyright, 1887, by Eadweard Muybridge.]

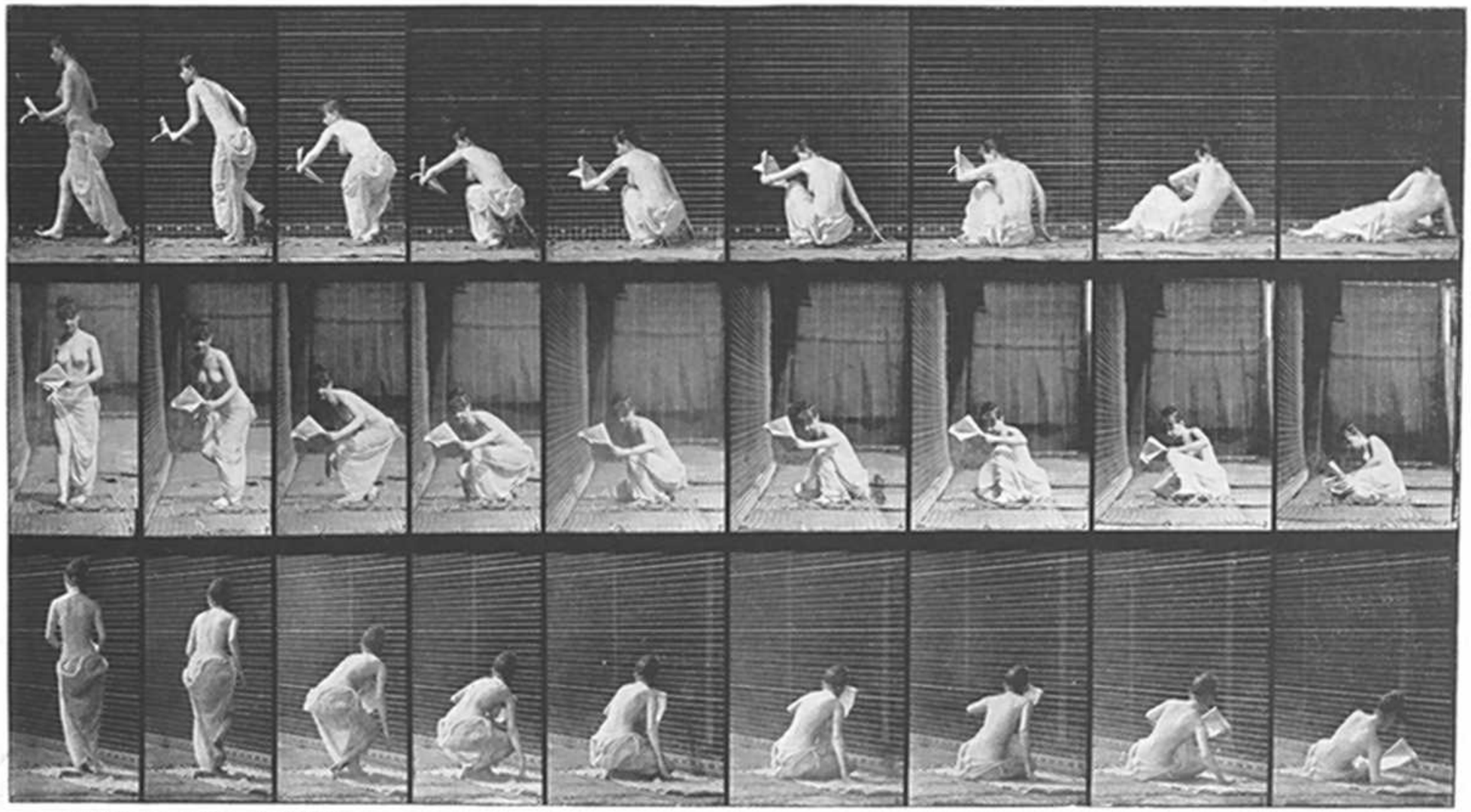
← SERIES 56.

WOMAN. SITTING DOWN ON THE GROUND.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 12. Time-intervals : ·232 second.

For some of these phases, from the original work, see page 249.



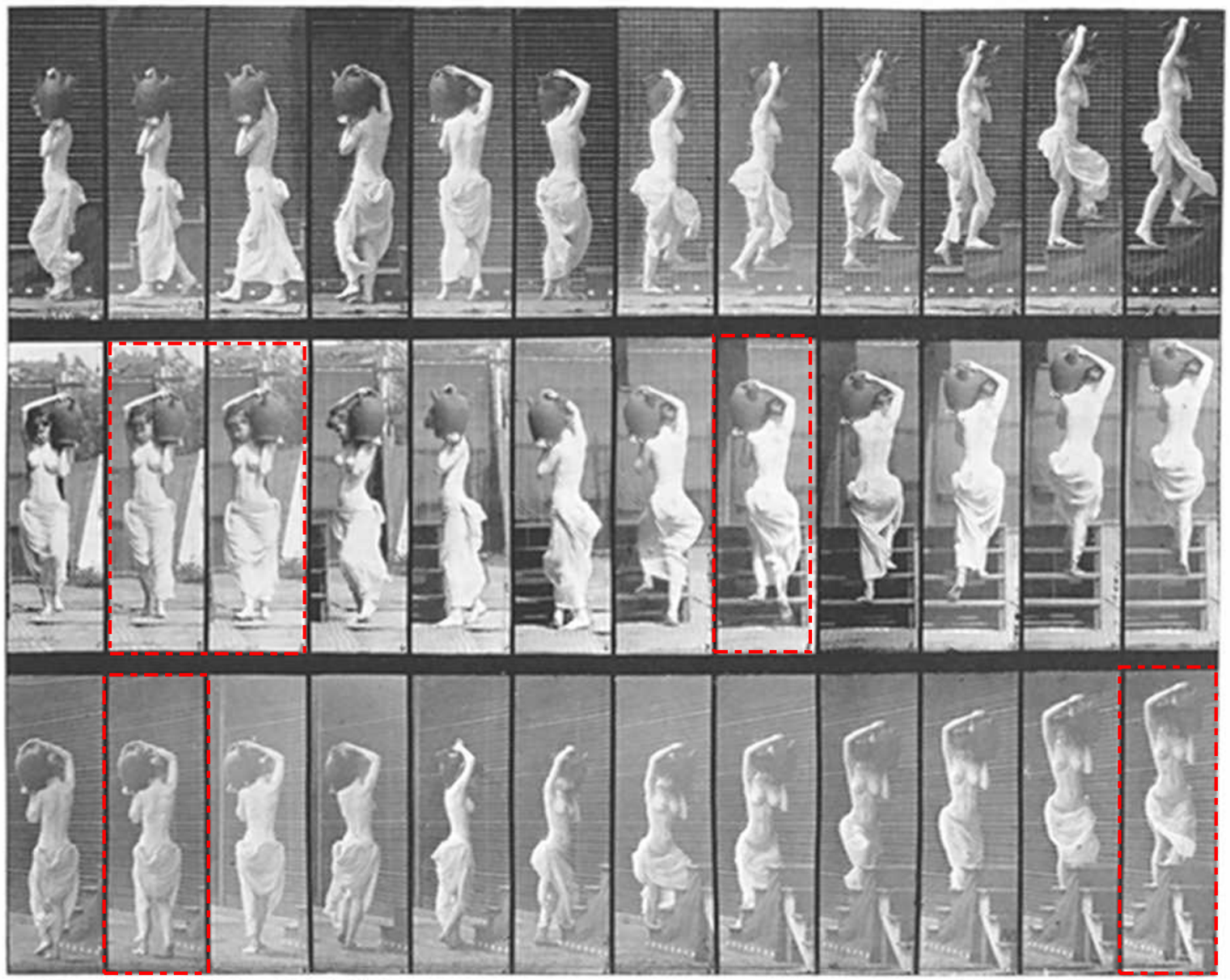
Copyright, 1887, by Eadweard Muybridge.]

← SERIES 57.

WOMAN. RISING FROM SITTING ON THE GROUND.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 12. Time-intervals : ·381 second.



Copyright, 1887, by Eadweard Muybridge.]

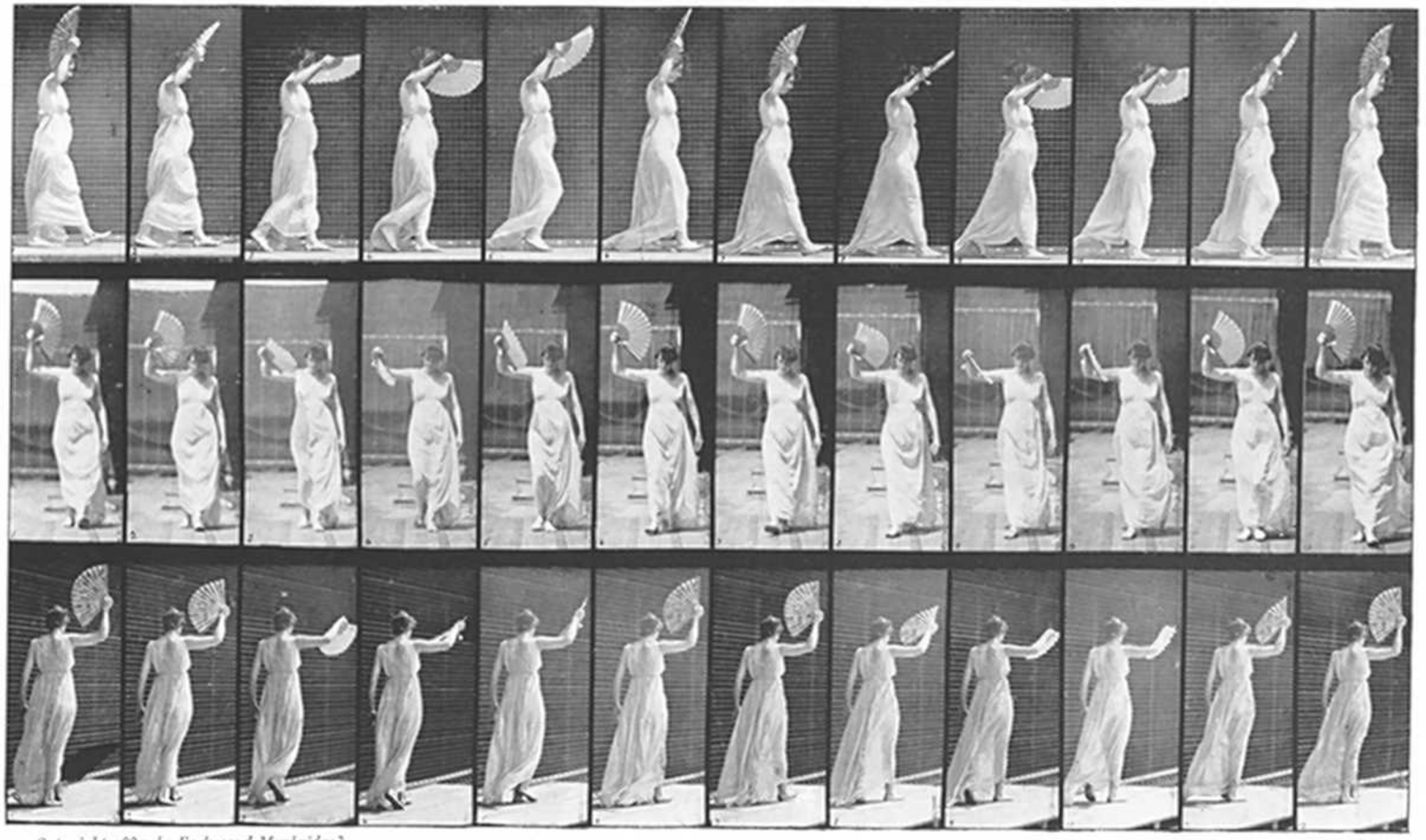
SERIES 58.

WOMAN. TURNING AROUND AND ASCENDING STAIRWAY.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 12. Time-intervals : ·446 second.

For some of these phases, from the original work, see page 247.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 59.

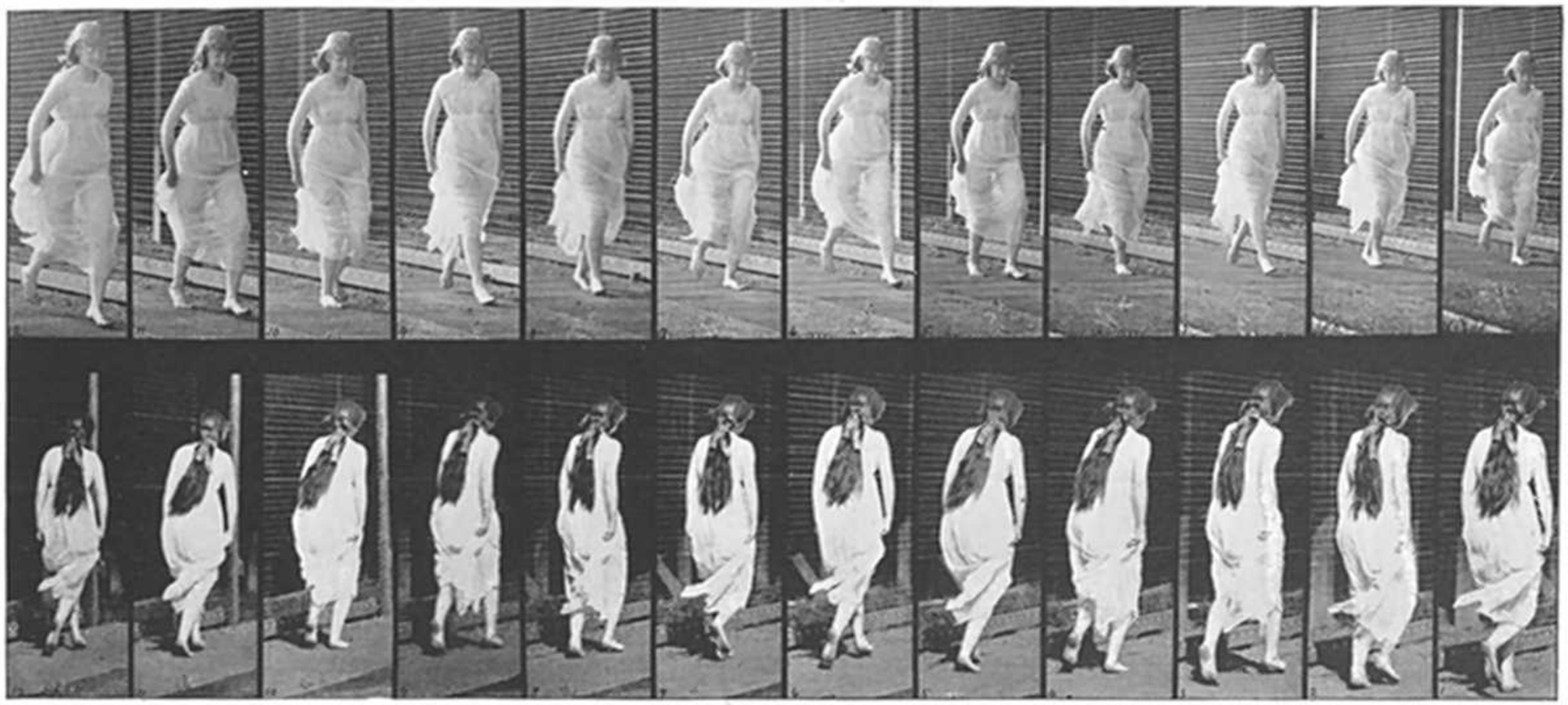
WOMAN. WALKING, AND FLIRTING A FAN.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 8.

Time-intervals: ·115 second.

For some of these phases, from the original work, see page 259.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 60.

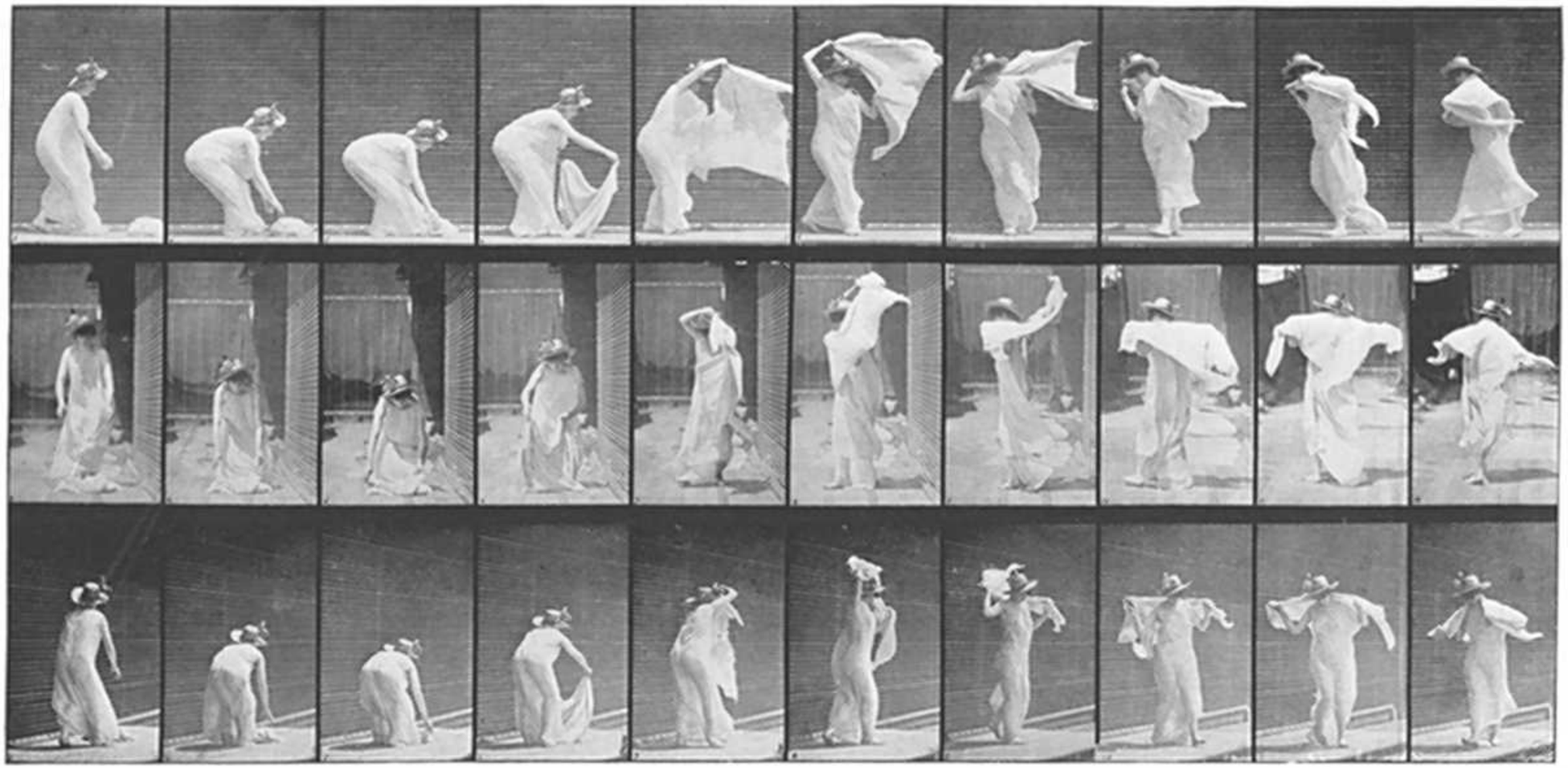
WOMAN. RUNNING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 7.

Time-intervals: ·100 second.

For a phase of this series, from the original work, see page 247.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 61.

WOMAN. THROWING A SHAWL AROUND HER SHOULDERS.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model S. Time-intervals : ·271 second.

For some of these phases, from the original work, see page 251.

Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 62.

DANCING-GIRL. A PIROUETTE.

PHOTOGRAPHED SYNCHRONOUSLY WITH SERIATES 63 AND 64.

Model 12.

Time-intervals : ·277 second.

For some of these phases, from the original work, see pages 253 and 255.

Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 63.

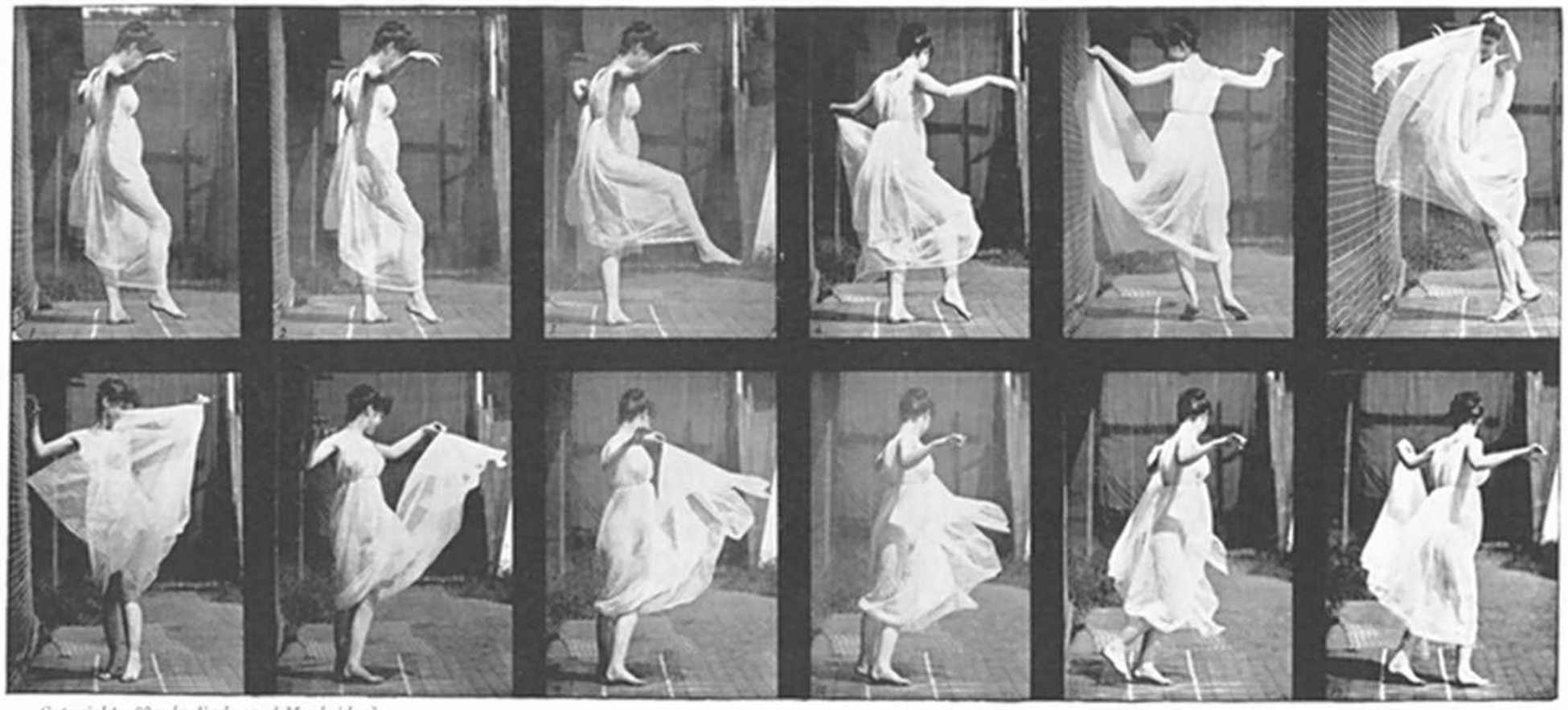
DANCING-GIRL. A PIROUETTE.

PHOTOGRAPHED SYNCHRONOUSLY WITH SERIATES 62 AND 64.

Model 12.

Time-intervals: ·277 second.

For some of these phases, from the original work, see pages 253 and 255.



Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 64

DANCING-GIRL. A PIROUETTE.

PHOTOGRAPHED SYNCHRONOUSLY WITH SERIATES 62 AND 63.

Model 12.

Time-intervals : ·277 second.

For some of these phases, from the original work, see pages 253 and 255.

Copyright, 1887, by Eadweard Muybridge.]

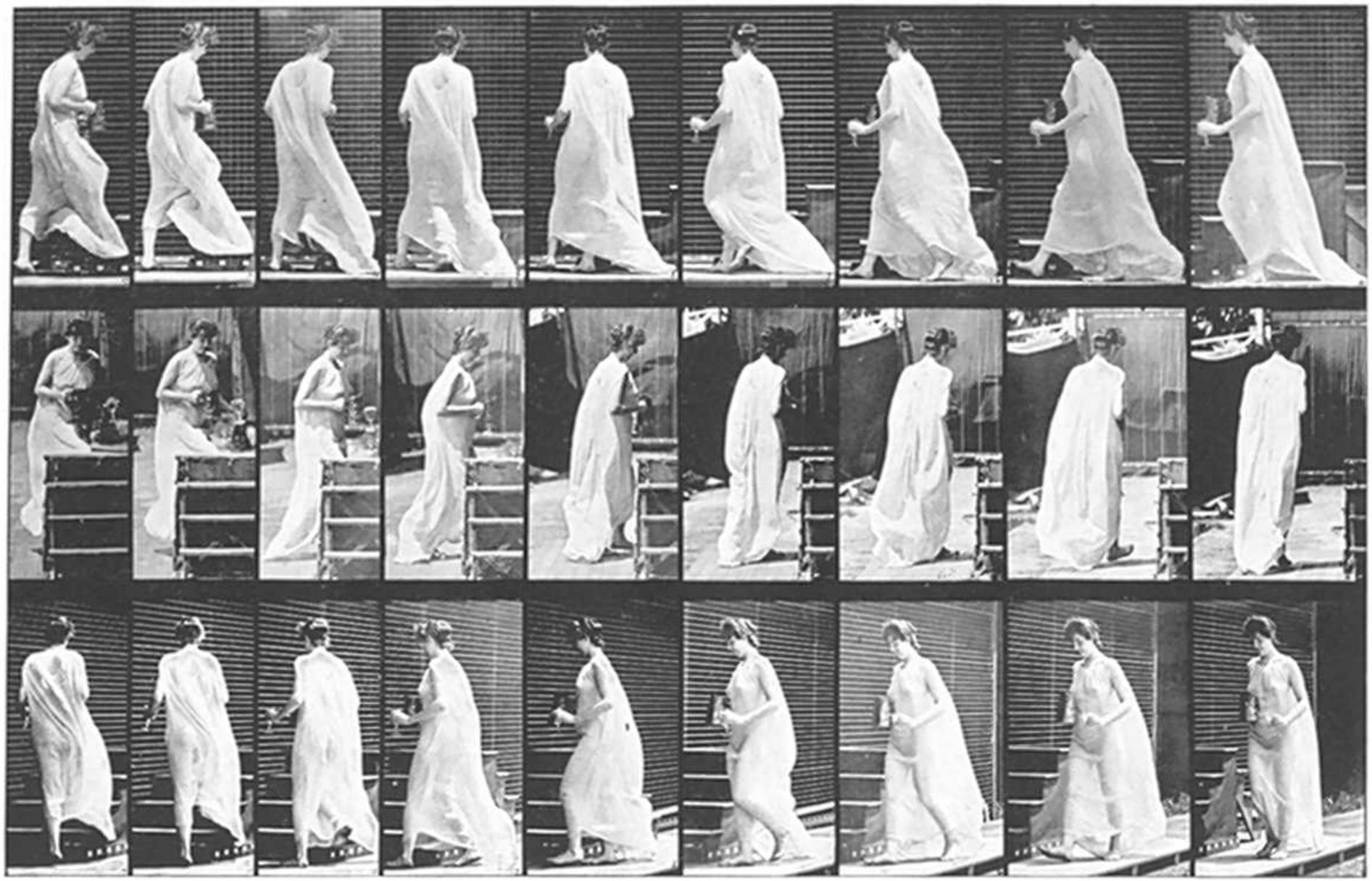
SERIES 65.

WOMAN. RAISING HANDS AND TURNING AROUND.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 12. Time-intervals: ·228 second.

For a phase of this series, from the original work, see page 257.



Copyright, 1887, by Eadweard Muybridge.]

← SERIES 66.

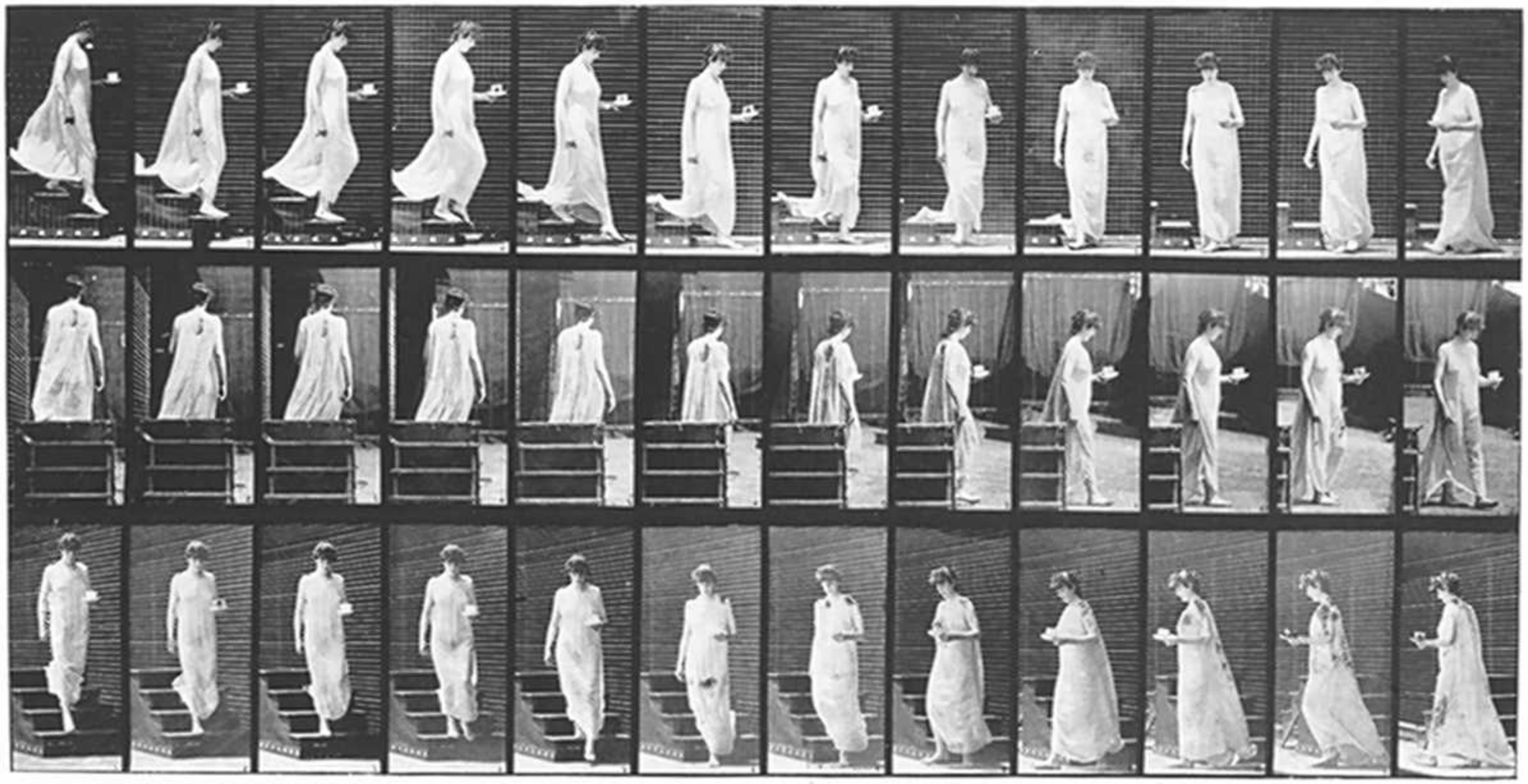
WOMAN. ASCENDING A STAIRWAY.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 8.

Time-intervals: ·161 second.

For a phase of this series, from the original work, see page 259.



Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 67.

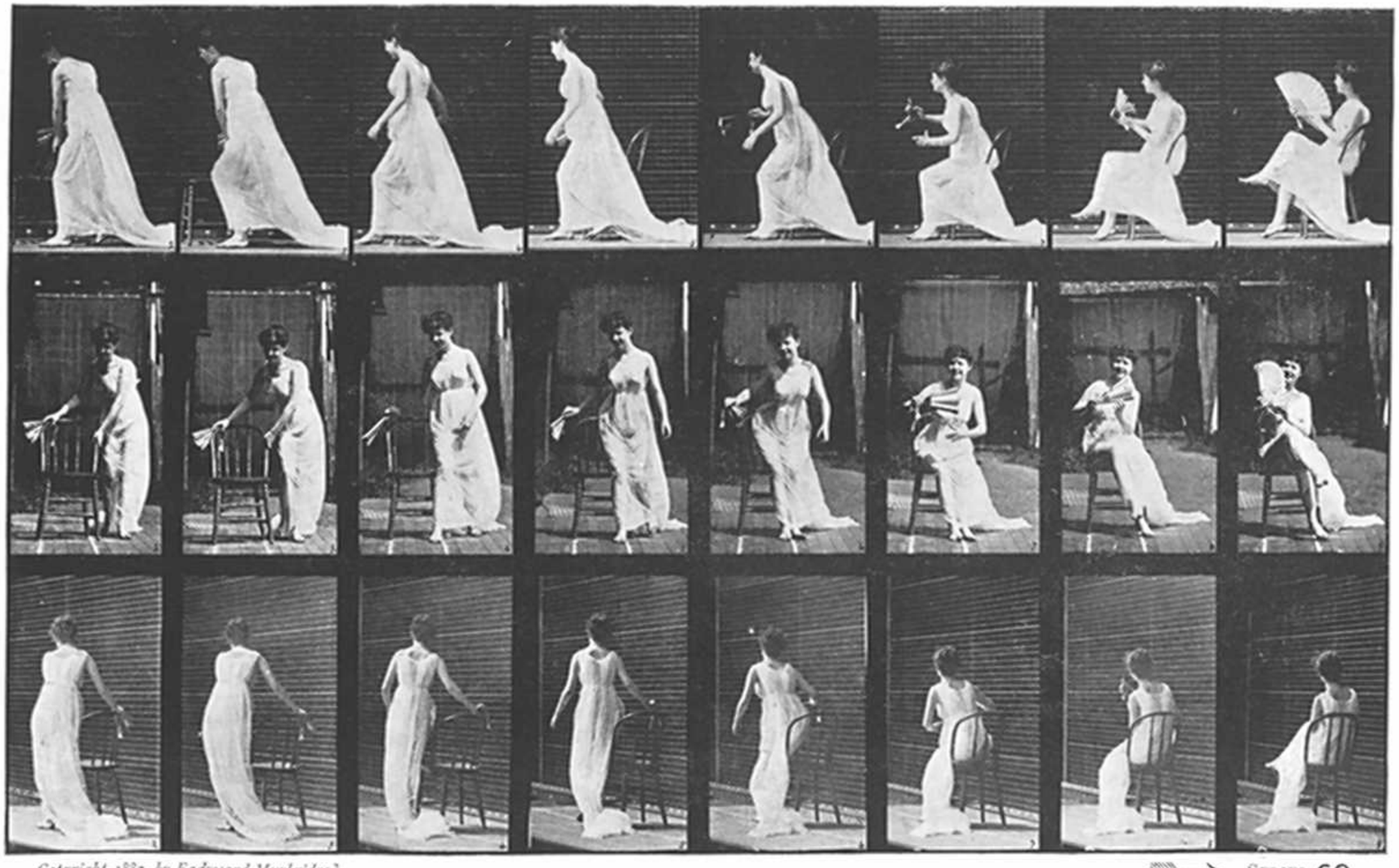
WOMAN. DESCENDING A STAIRWAY, AND TURNING AROUND.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 8.

Time-intervals : ·181 second.

For some phases of this action, from the original work, see page 251.



Copyright, 1887, by Eadweard Muybridge.]

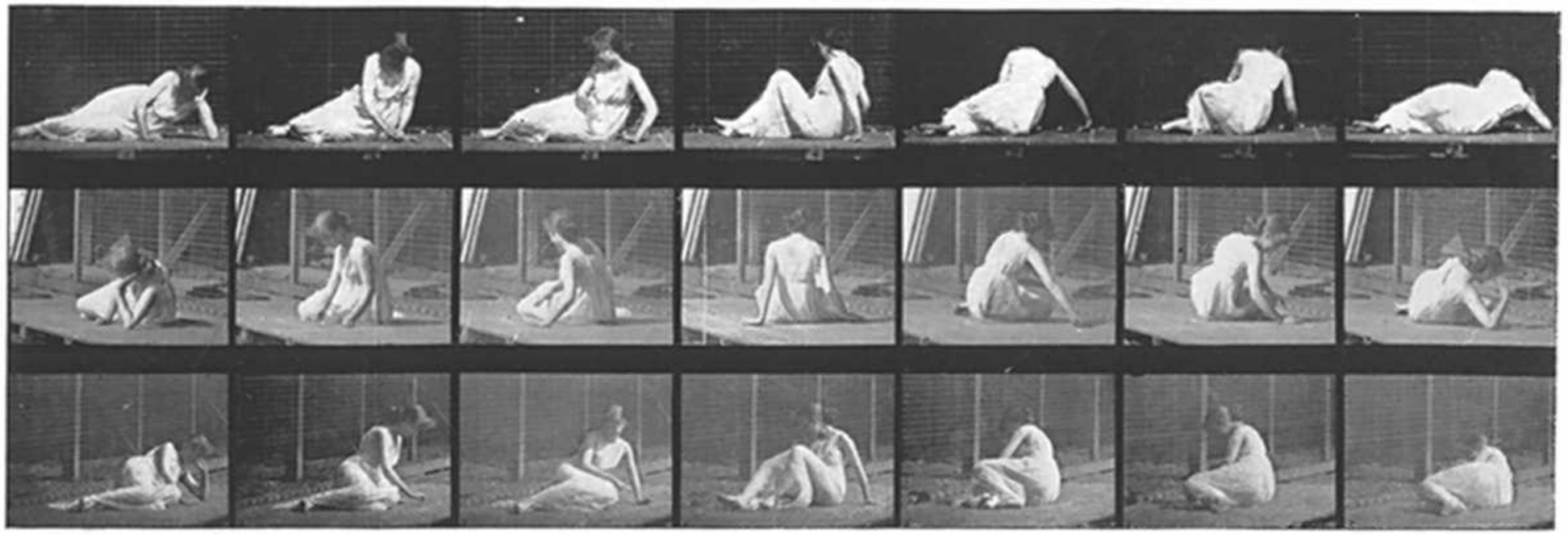
→ SERIES 68.

WOMAN. SITTING DOWN AND FLIRTING A FAN.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 12. Time-intervals: ·241 second.

For some of these phases, from the original work, see page 257.



Copyright, 1887, by Eadweard Muybridge.]

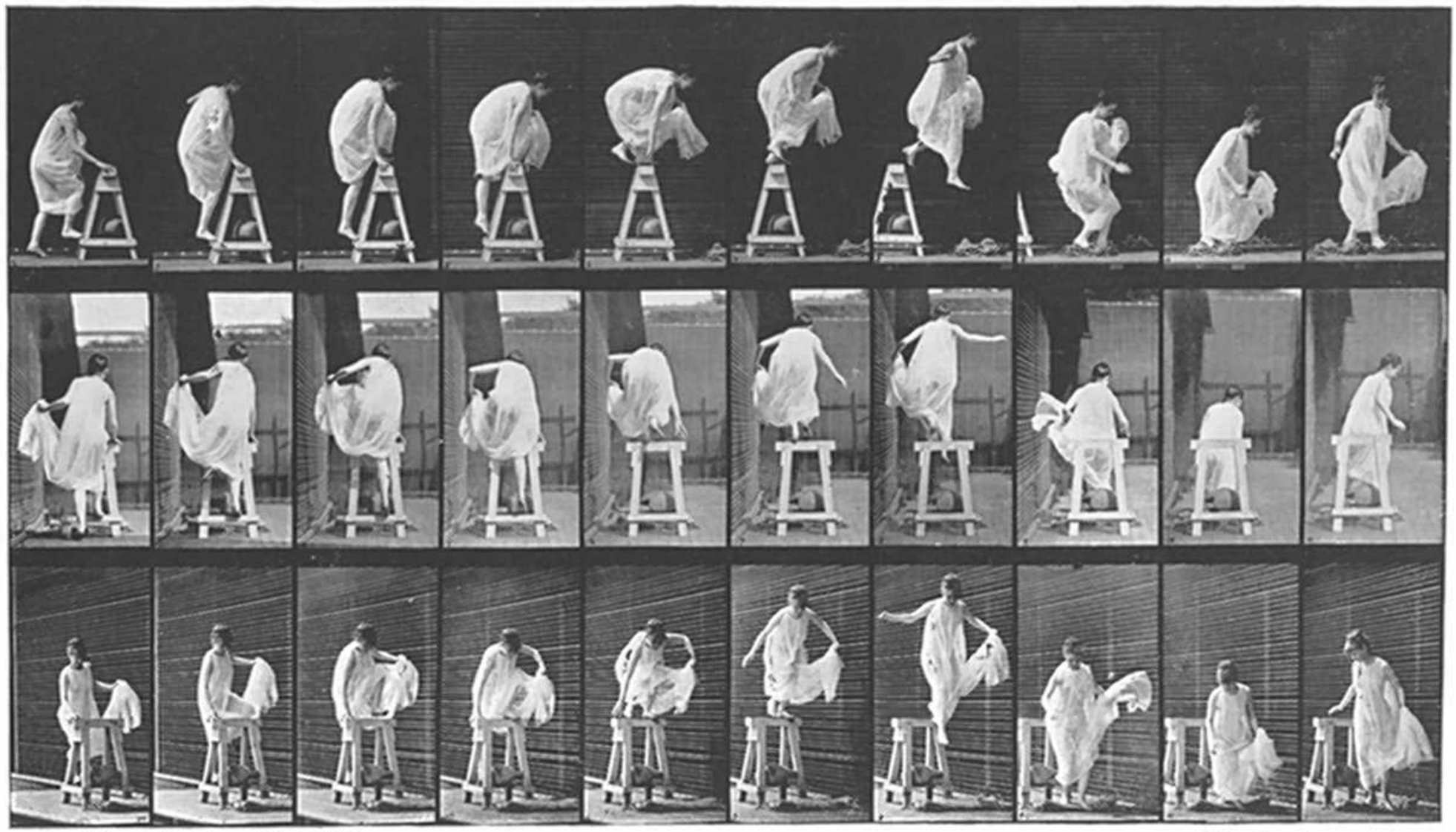
→ SERIES 69.

WOMAN. TURNING AROUND ON THE GROUND.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 7.

Time-intervals: irregular.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 70.

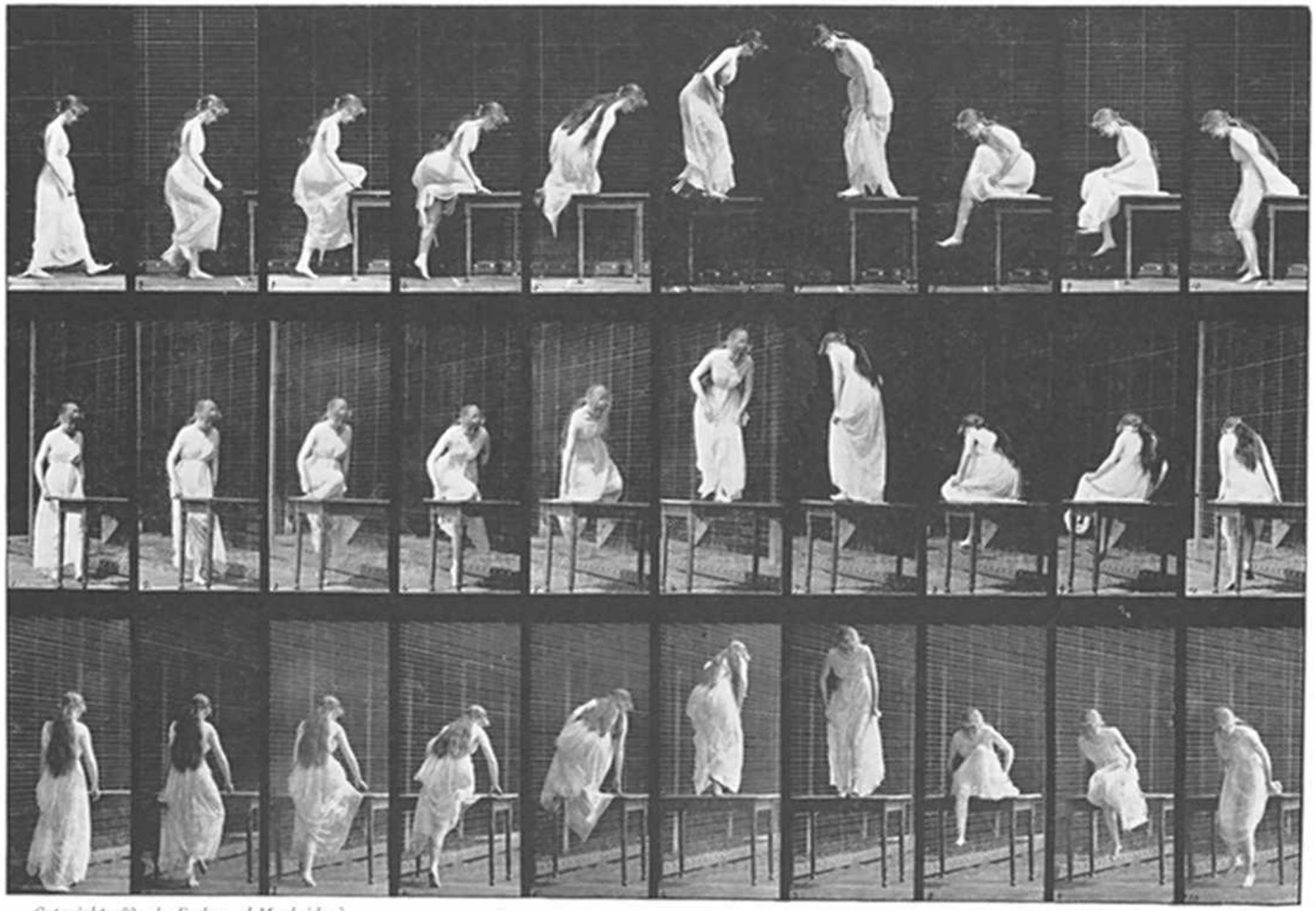
WOMAN. MAKING A HIGH-STEP, AND JUMPING.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 12.

Time-intervals: ·290 second.

For some of these phases, from the original work, see page 249.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 71.

WOMAN. ASCENDING AND DESCENDING FROM A TABLE.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 7.

Time-intervals: irregular.

For a phase of this series, from the original work, see page 259.

Copyright, 1887, by Eadweard Muybridge.

SERIES 72.

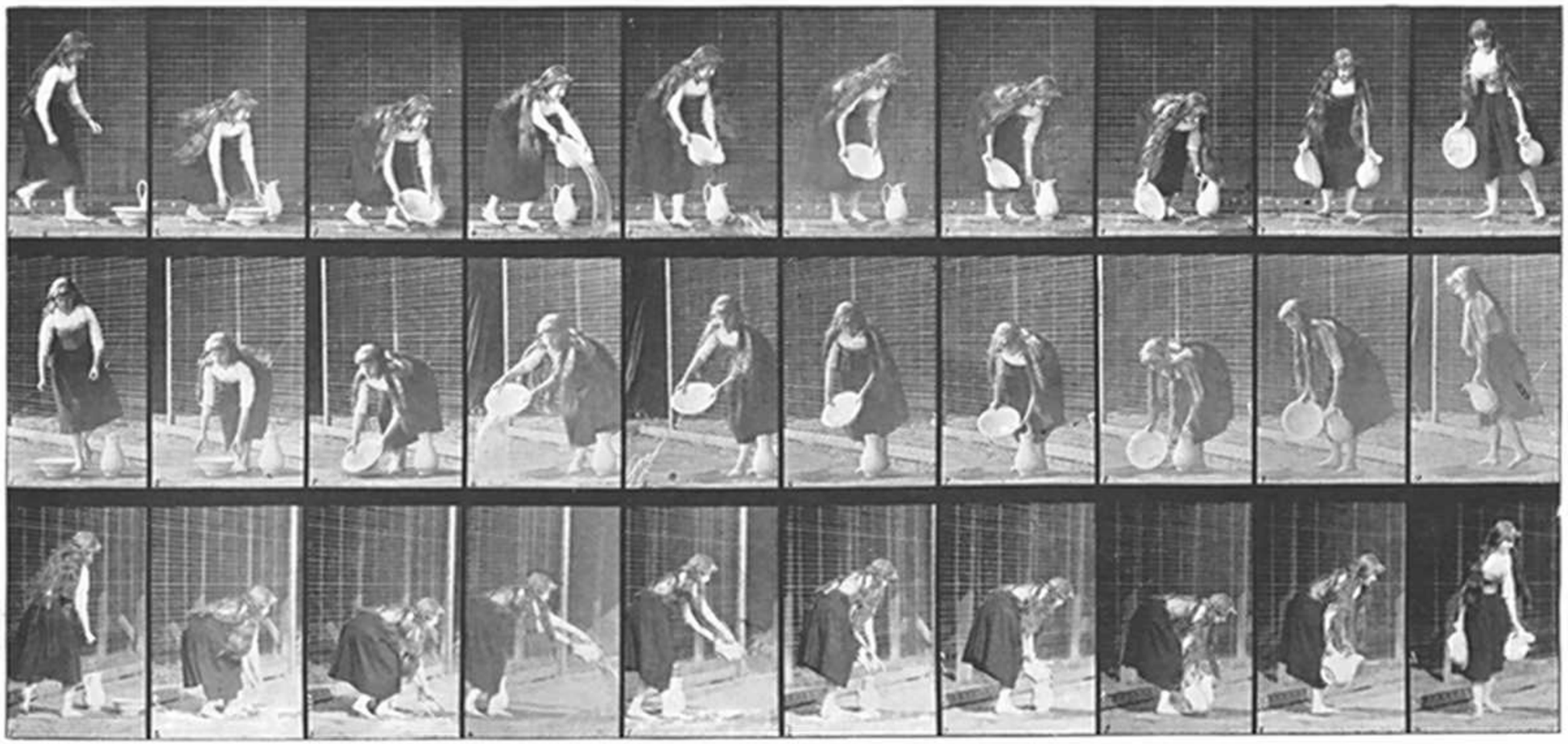
WOMAN. WITH A BASKET ON HER HEAD, TURNING AROUND.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 7.

Time-intervals : ·219 second.

For some of these phases, from the original work, see page 261.



Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 73.

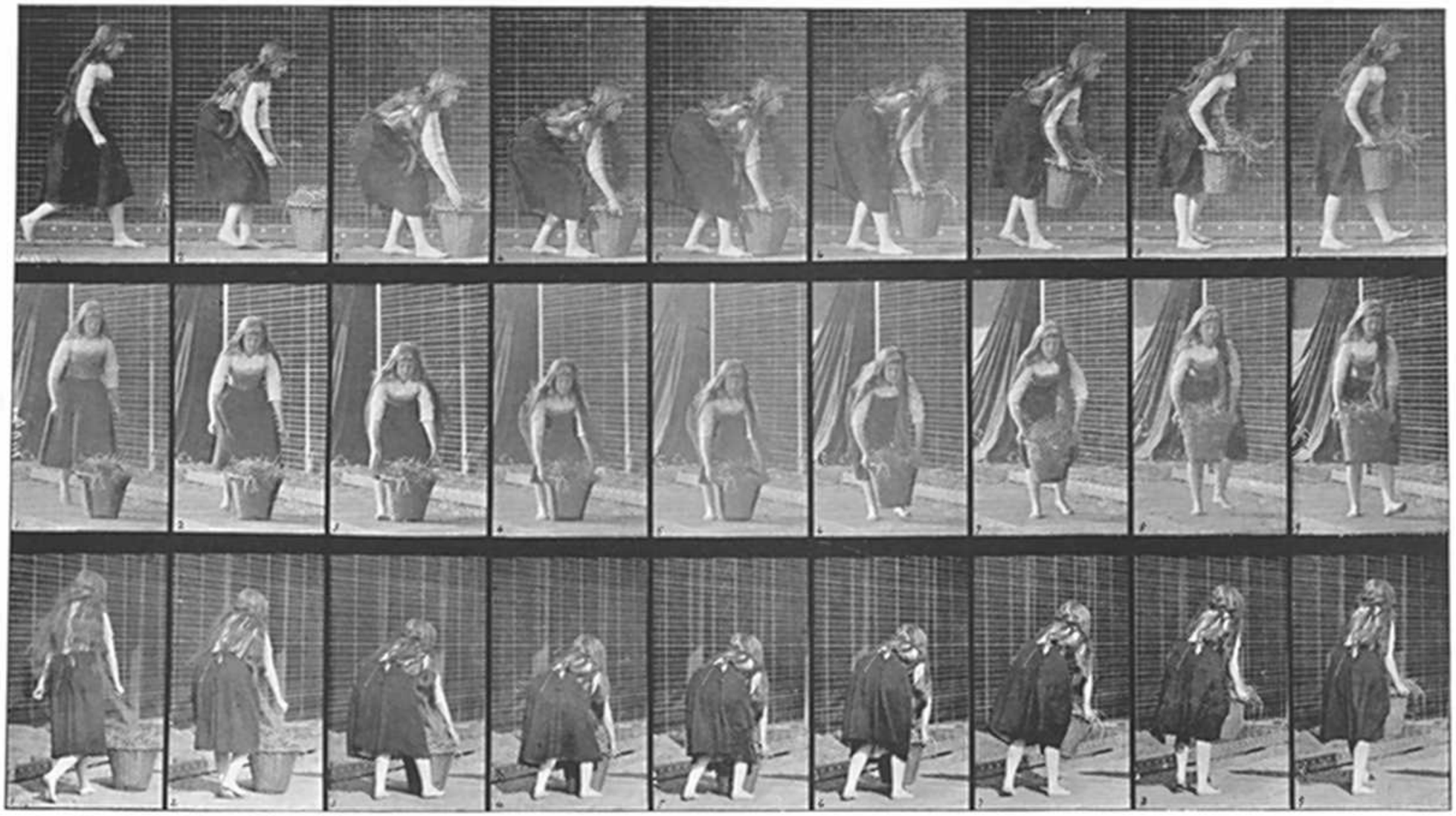
WOMAN. EMPTYING A BASIN OF WATER.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 7.

Time-intervals : ·469 second.

For a phase of this series, from the original work, see page 257.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 74.

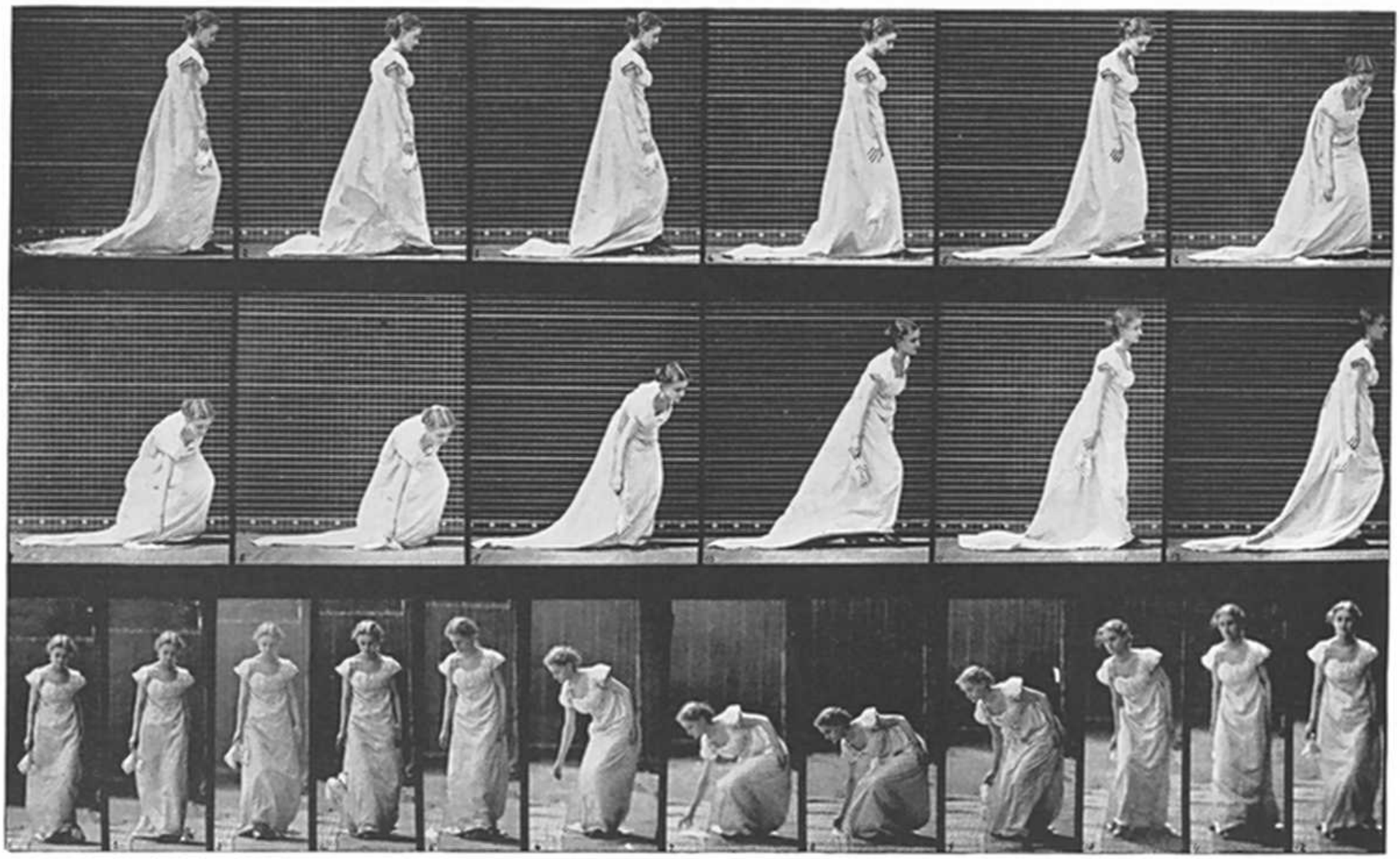
WOMAN. LIFTING A BUSHEL BASKET.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 7.

Time-intervals : ·200 second.

For a phase of this series, from the original work, see page 257.



Copyright, 1887, by Eadweard Muybridge.]

→ SERIES 75.

WOMAN. STOOPING TO PICK UP A HANDKERCHIEF.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 5.

Time-intervals : ·345 second.

For some of these phases, from the original work, see page 263.

Copyright, 1887, by Eadweard Muybridge.]

SERIES 76.

WOMAN. ADJUSTING TRAIN AND TURNING AROUND.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

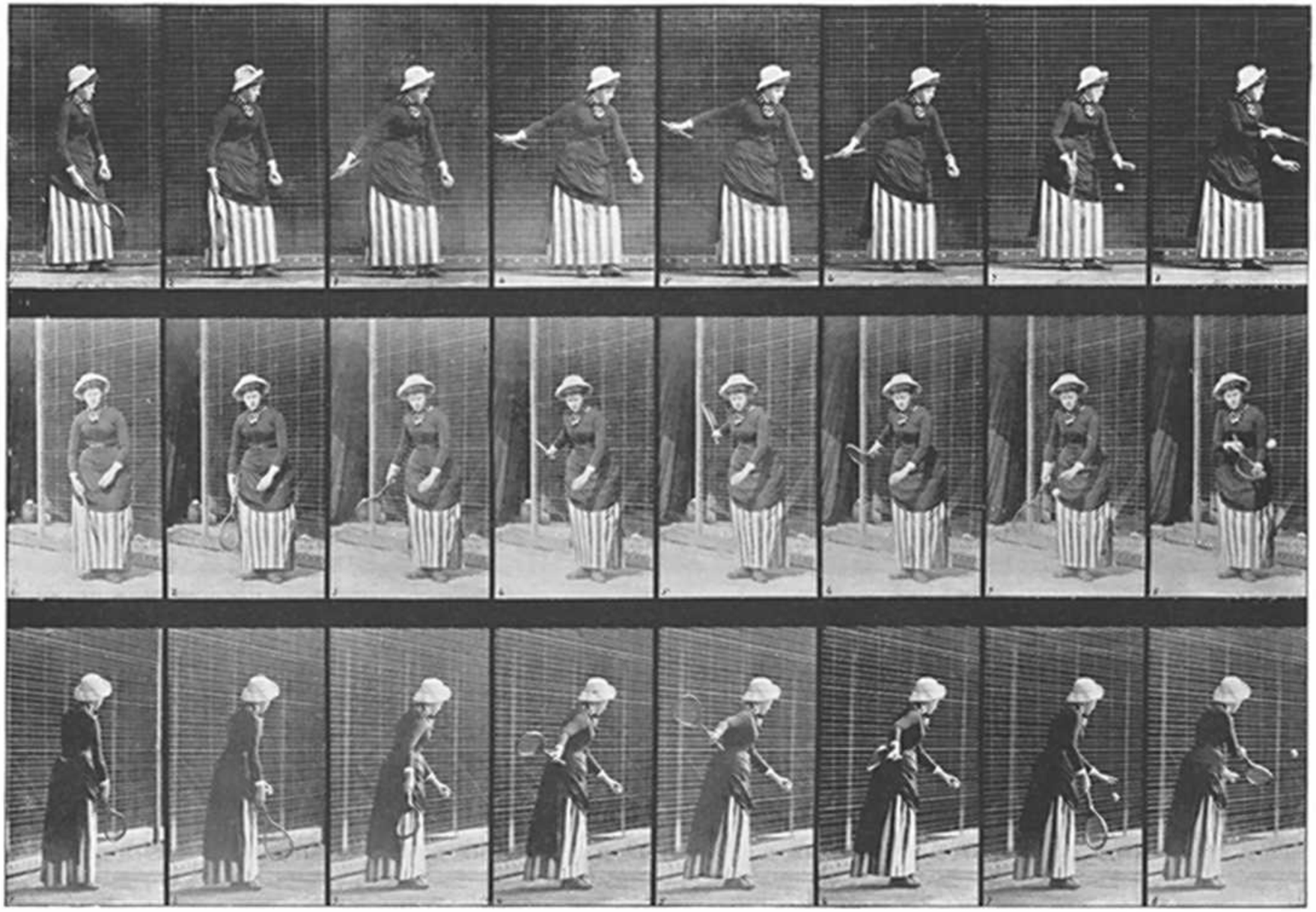
Model 5. Time-intervals : ·165 second.

Copyright, 1887, by Eadweard Muybridge.]

← SERIES 77.

WOMAN. DESCENDING A STAIRWAY.

Model 15.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 78.

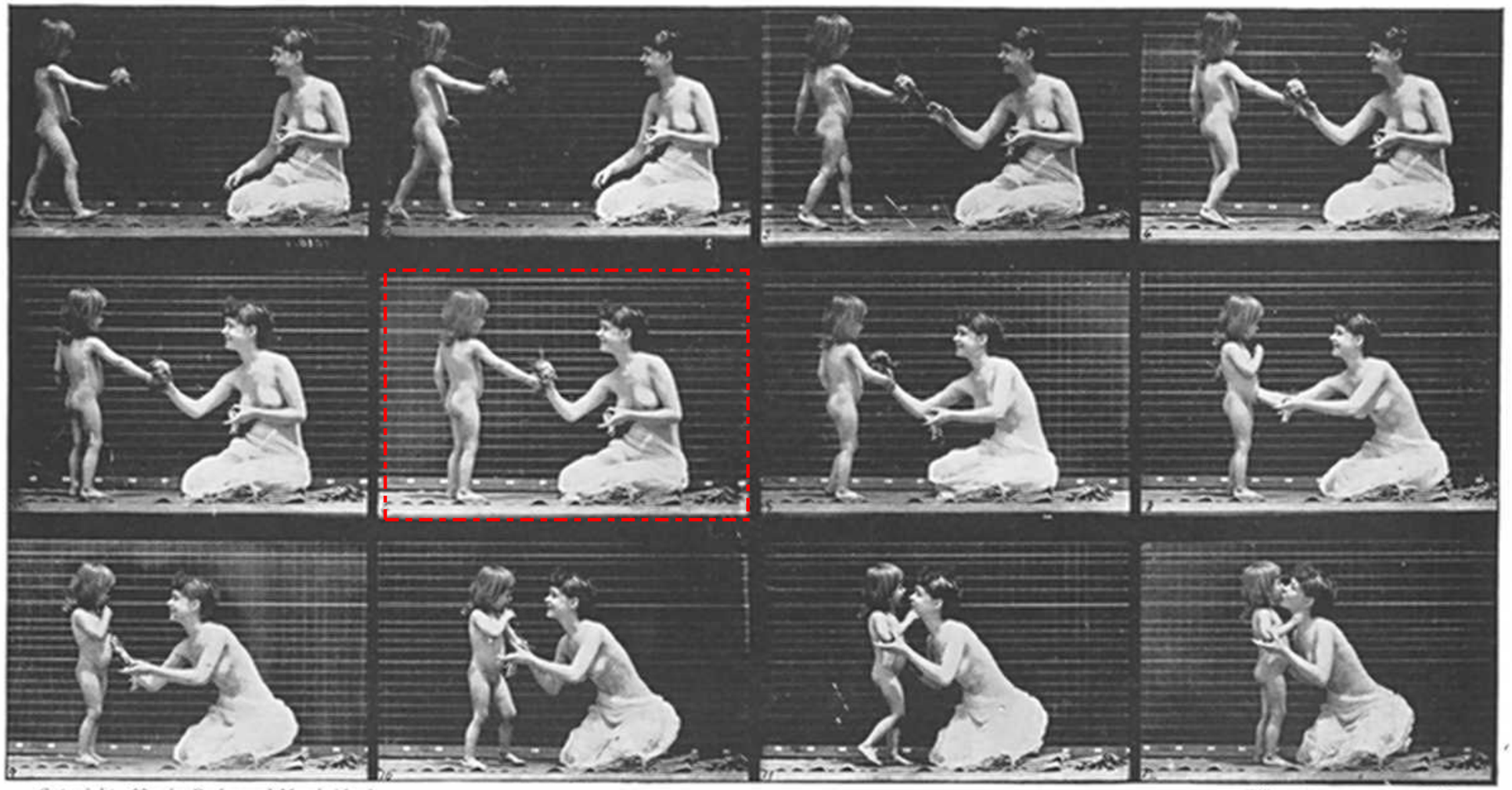
WOMAN. PLAYING AT LAWN-TENNIS.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 15.

Time-intervals : ·152 second.

For some phases of a similar action, from the original work, see page 261.



Copyright, 1887, by Eadweard Muybridge.]

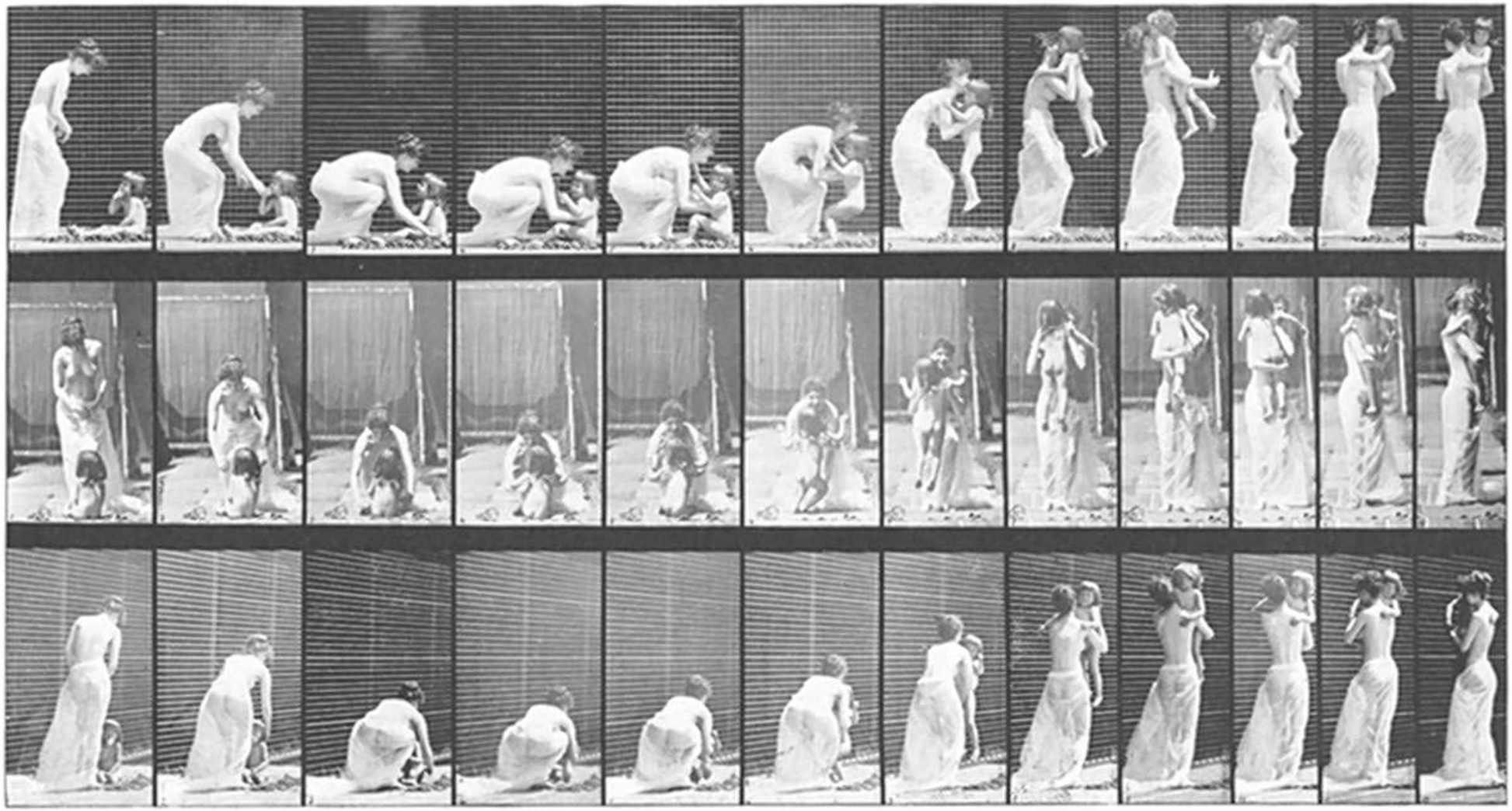
SERIES 79.

CHILD. GREETING A STRANGER.

Models 12 and 70.

Time-intervals : '291 second.

For some of these phases, from the original work, see page 267.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 80.

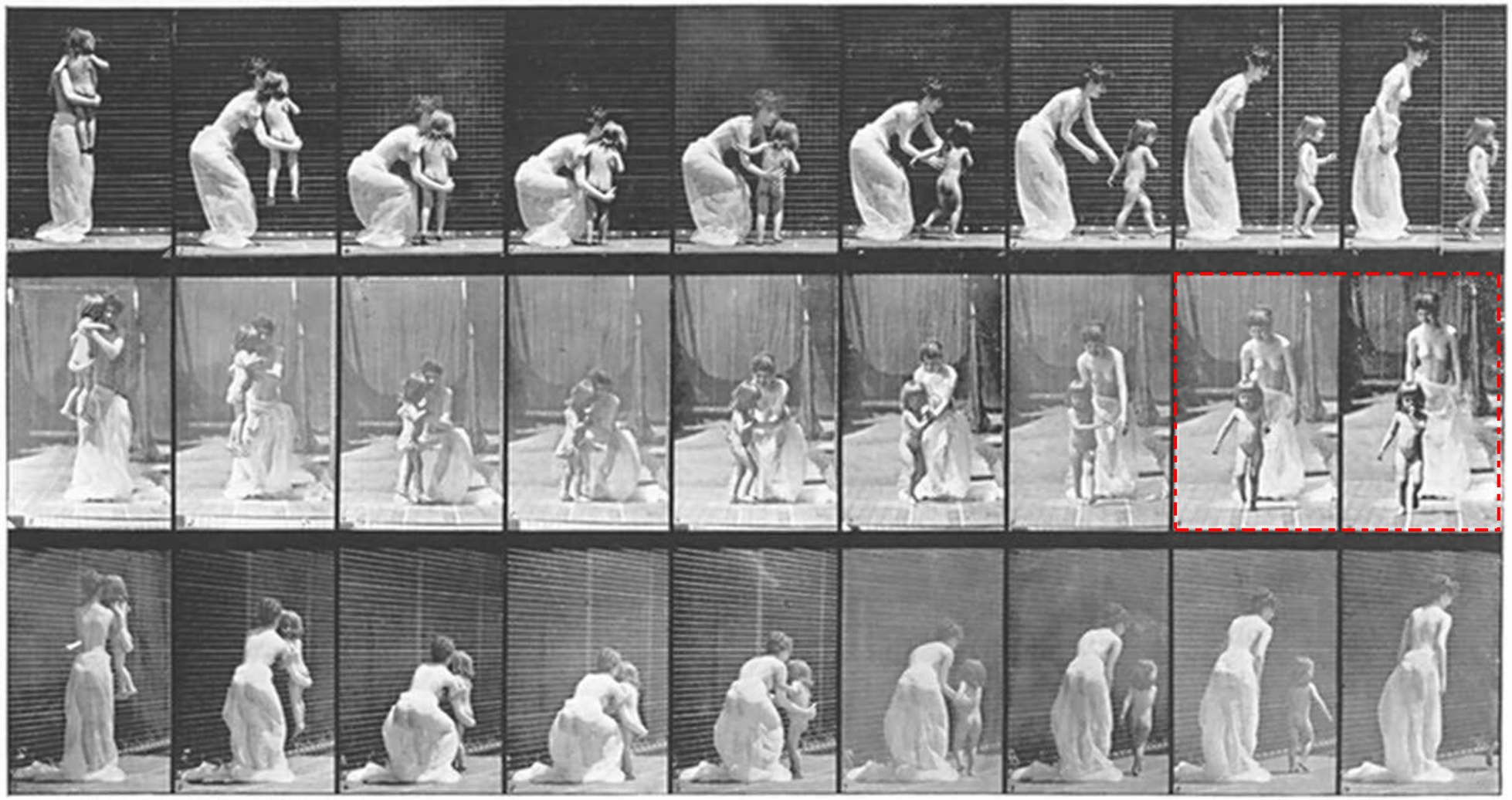
WOMAN. LIFTING AND CARRYING CHILD.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Models 12 and 70.

Time-intervals: ·311 second.

For some of these phases, from the original work, see page 265.



Copyright, 1887, by Eadweard Muybridge.]

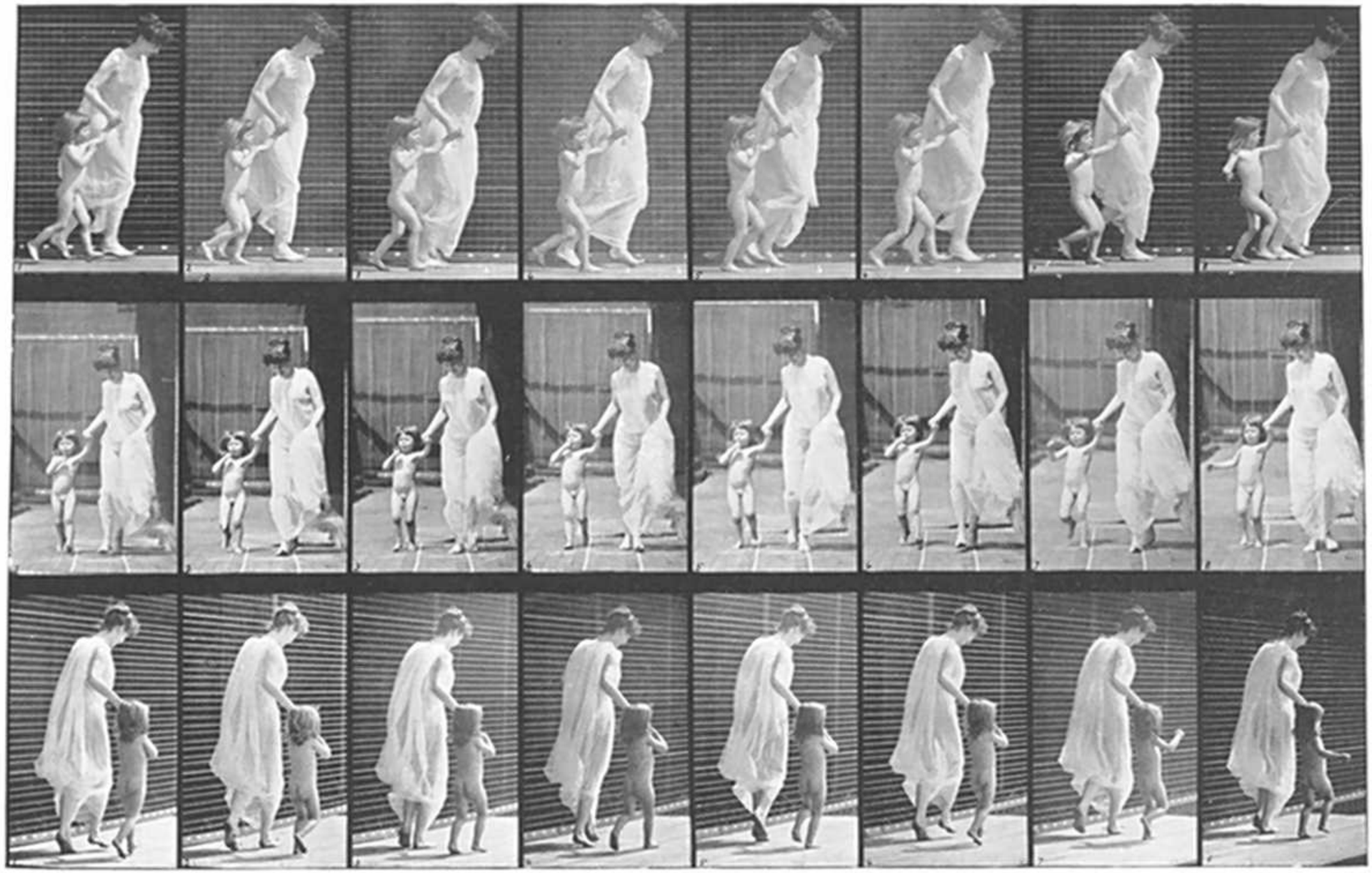
SERIES. 81.

WOMAN. PLACING CHILD ON THE GROUND.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Models 12 and 70.

Time-intervals: ·290 second.



Copyright, 1887, by Eadweard Muybridge.]

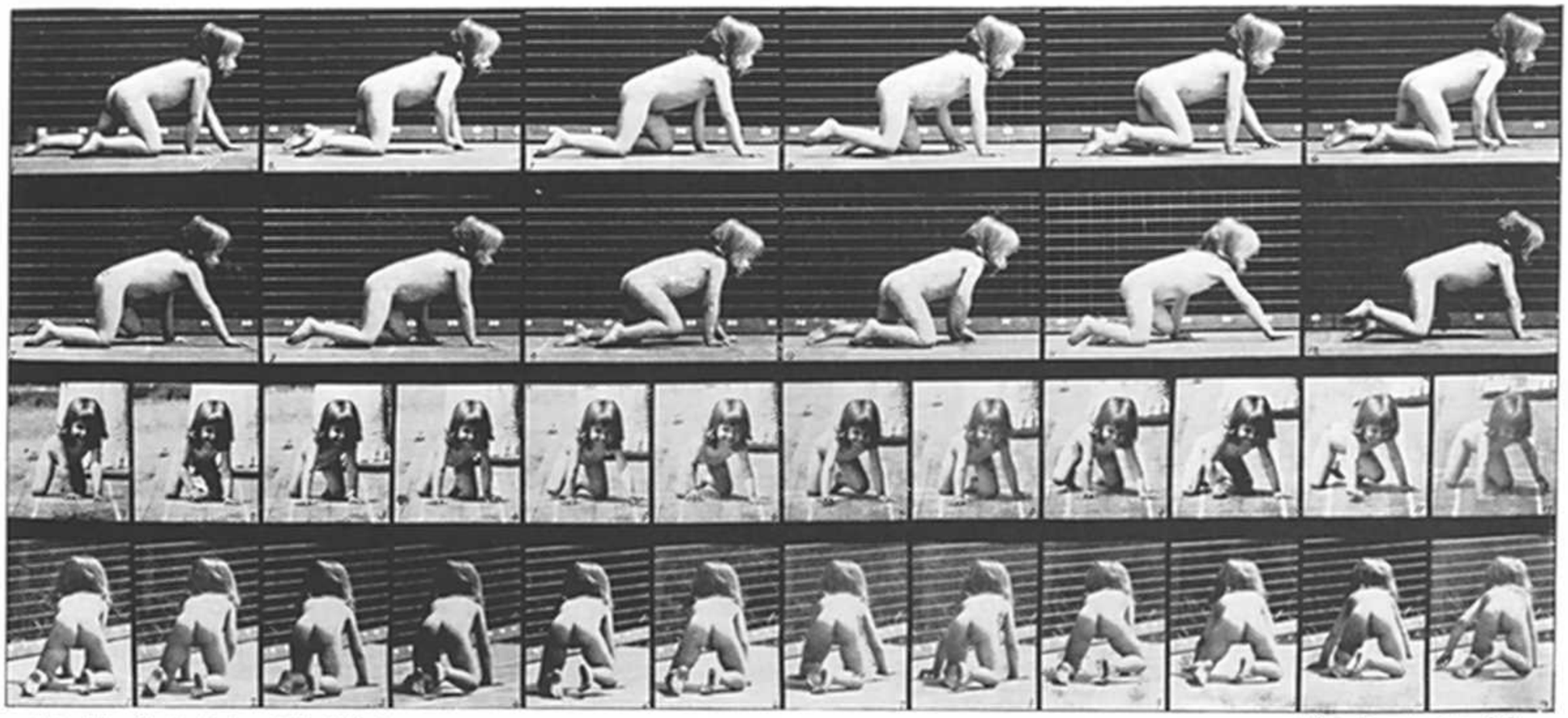
→ SERIES 82.

WOMAN AND CHILD. RUNNING.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Models 12 and 70.

Time-intervals : ·093 second.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 83.

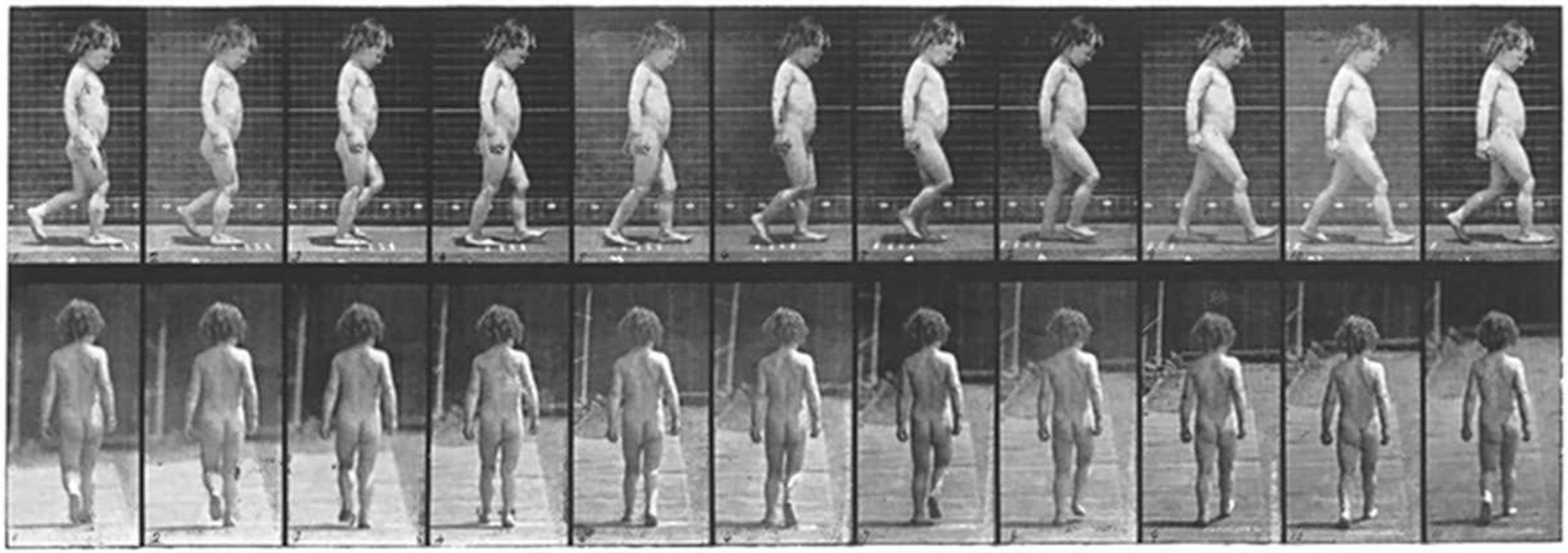
CHILD. CRAWLING ON THE GROUND.

PHOTOGRAPHED SYNCHRONOUSLY FROM THREE POINTS OF VIEW.

Model 70.

Time-intervals: ·169 second.

For some of these phases, from the original work, see page 269.



Copyright, 1887, by Eadweard Muybridge.]

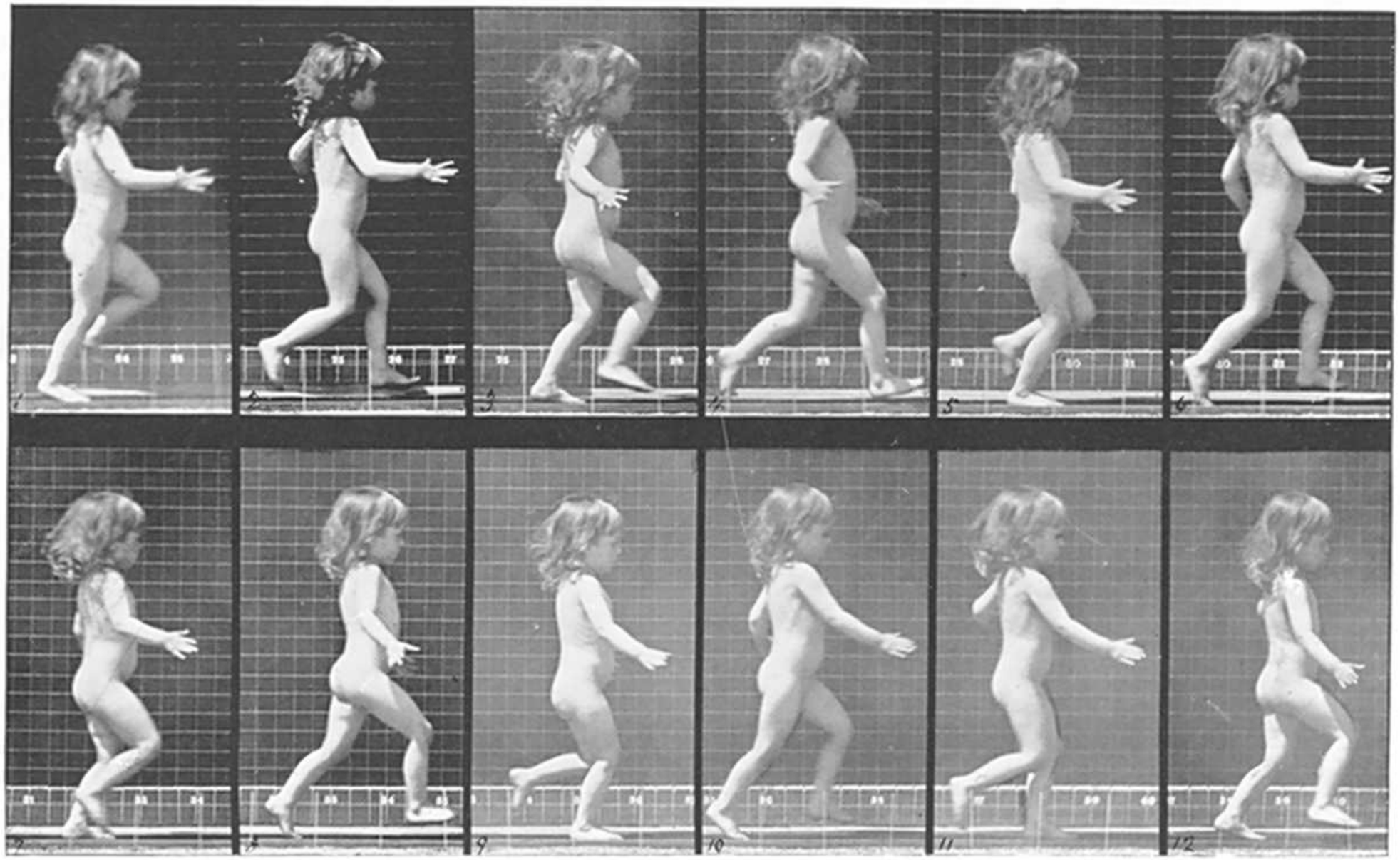
→ SERIES 84.

CHILD. WALKING.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 72.

Time-intervals : ·067 second.



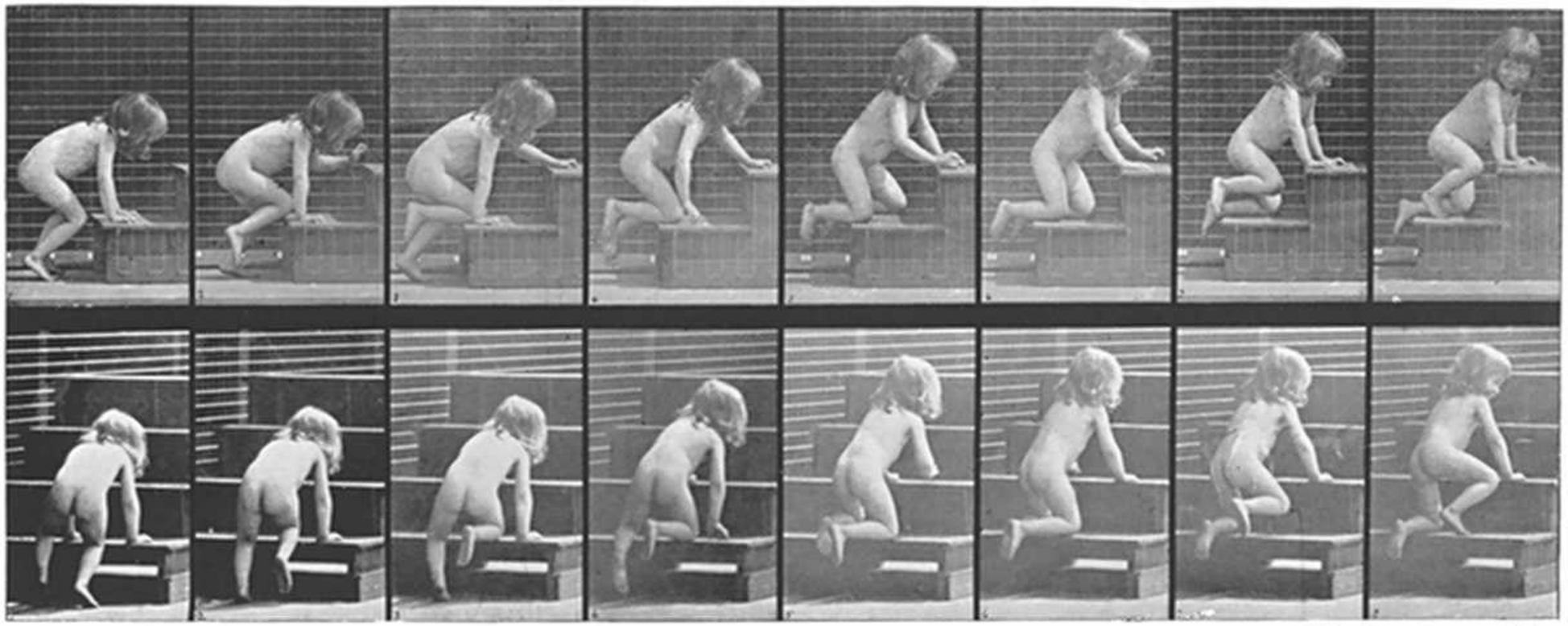
Copyright, 1887, by Eadweard Muybridge.]

SERIES 85.

CHILD. RUNNING.

Model 70.

Time-intervals: ·097 second.



Copyright, 1887, by Eadweard Muybridge.]

SERIES 86.

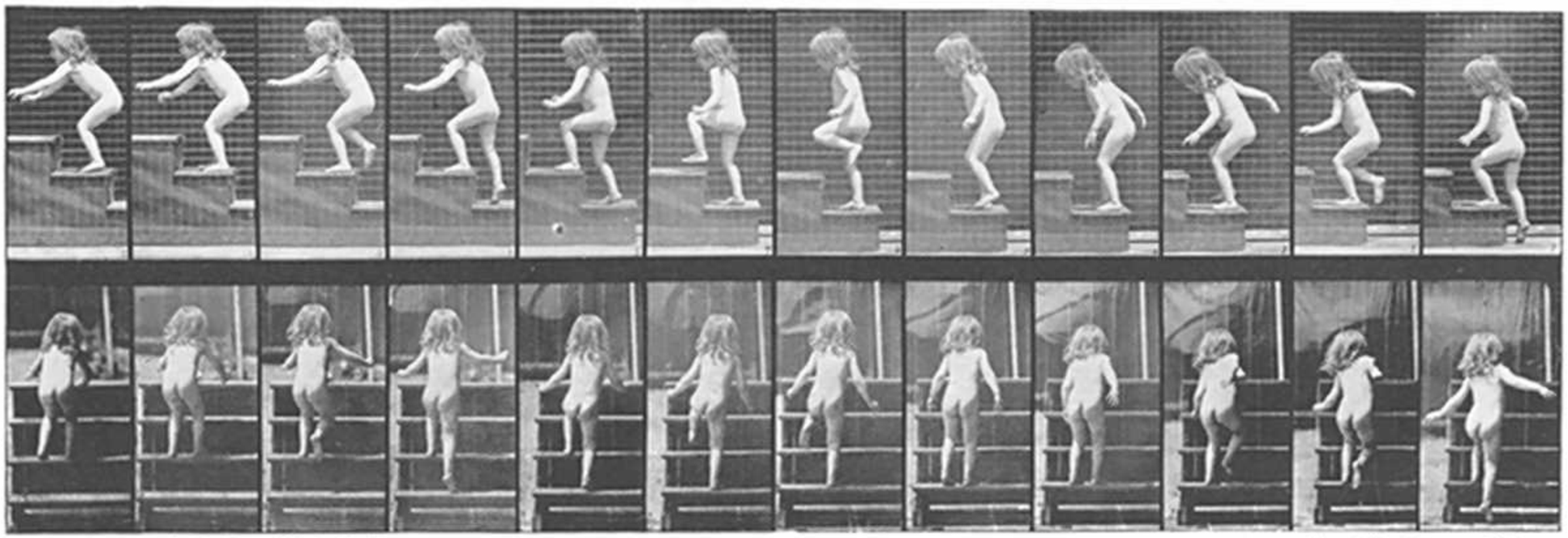
CHILD. CRAWLING UPSTAIRS.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 70.

Time-intervals : ·206 second.

For some of these phases, from the original work, see page 271.



Copyright, 1887, by Eadweard Muybridge.]

← SERIES 87.

CHILD. ATTEMPTING TO WALK UPSTAIRS.

PHOTOGRAPHED SYNCHRONOUSLY FROM TWO POINTS OF VIEW.

Model 70.

Time-intervals: ·161 second.

For some of these phases, from the original work, see page 271.

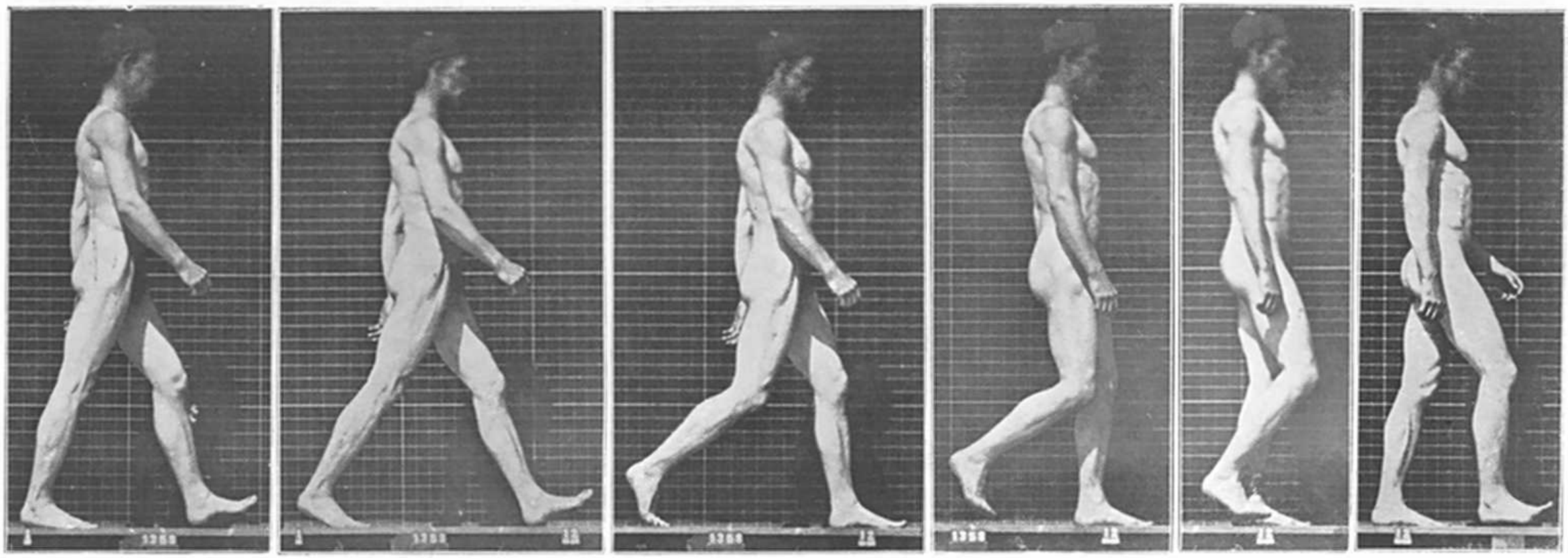
MISCELLANEOUS PHASES

OF

THE HUMAN FIGURE IN MOTION

SELECTED FROM VARIOUS SERIATES; AND REPRODUCED ON THE SAME SCALE AS ORIGINALLY PUBLISHED IN "ANIMAL LOCOMOTION"

1887

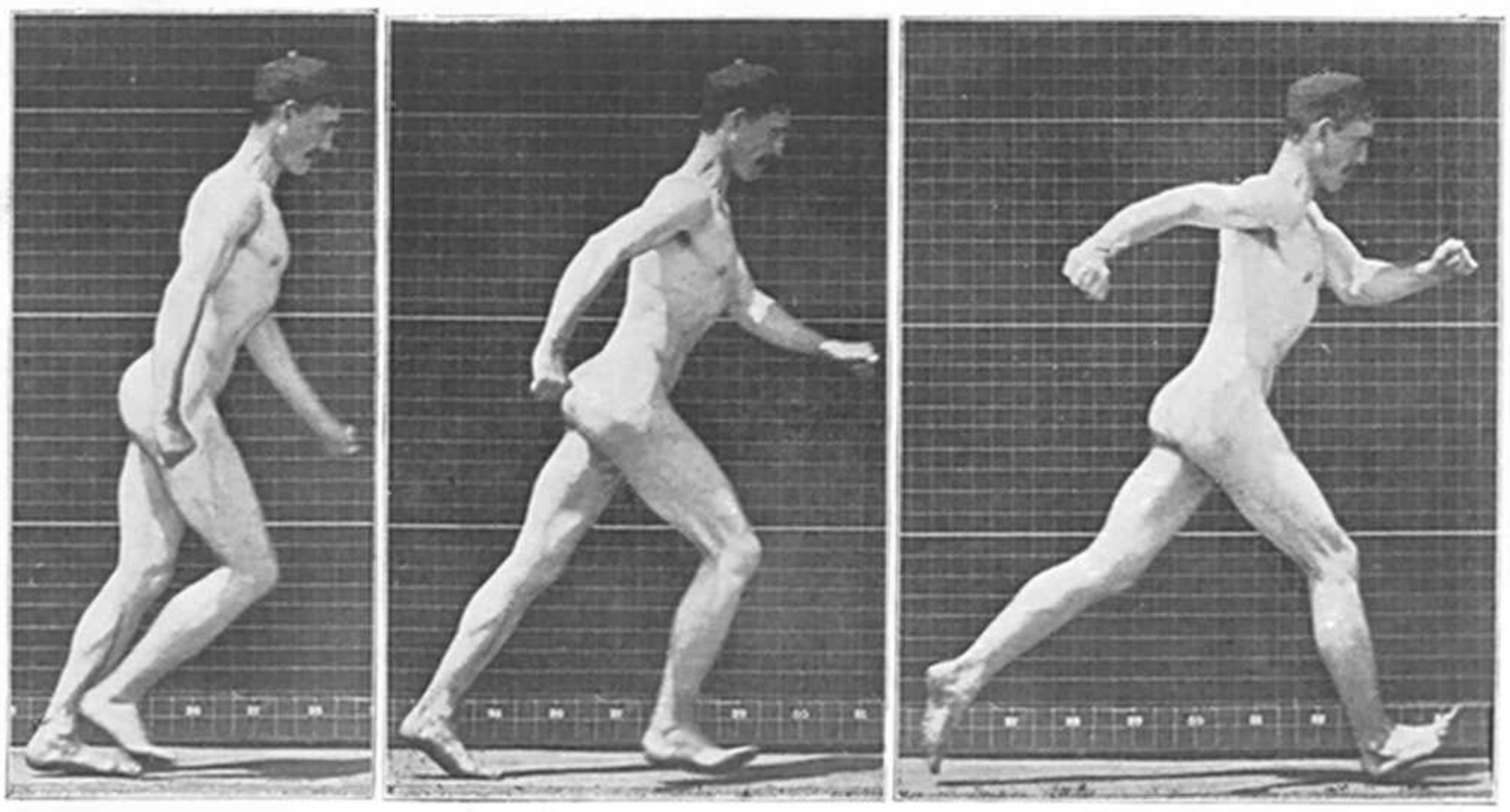


Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES IN THE WALK OF AN ATHLETE.

Model 46. ORDINARY SPEED. Time-intervals: ·090 second.

See Series 1.

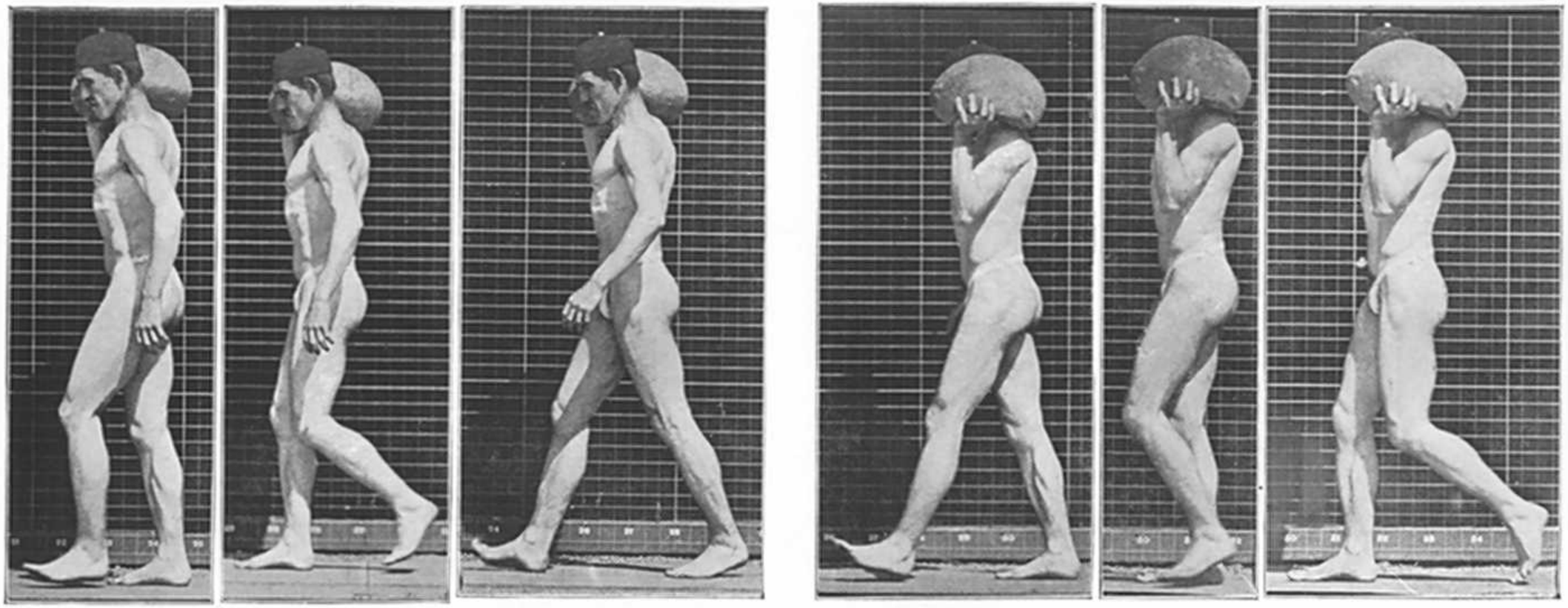


Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES IN THE WALK OF AN ATHLETE.

Model 46. RAPID SPEED.

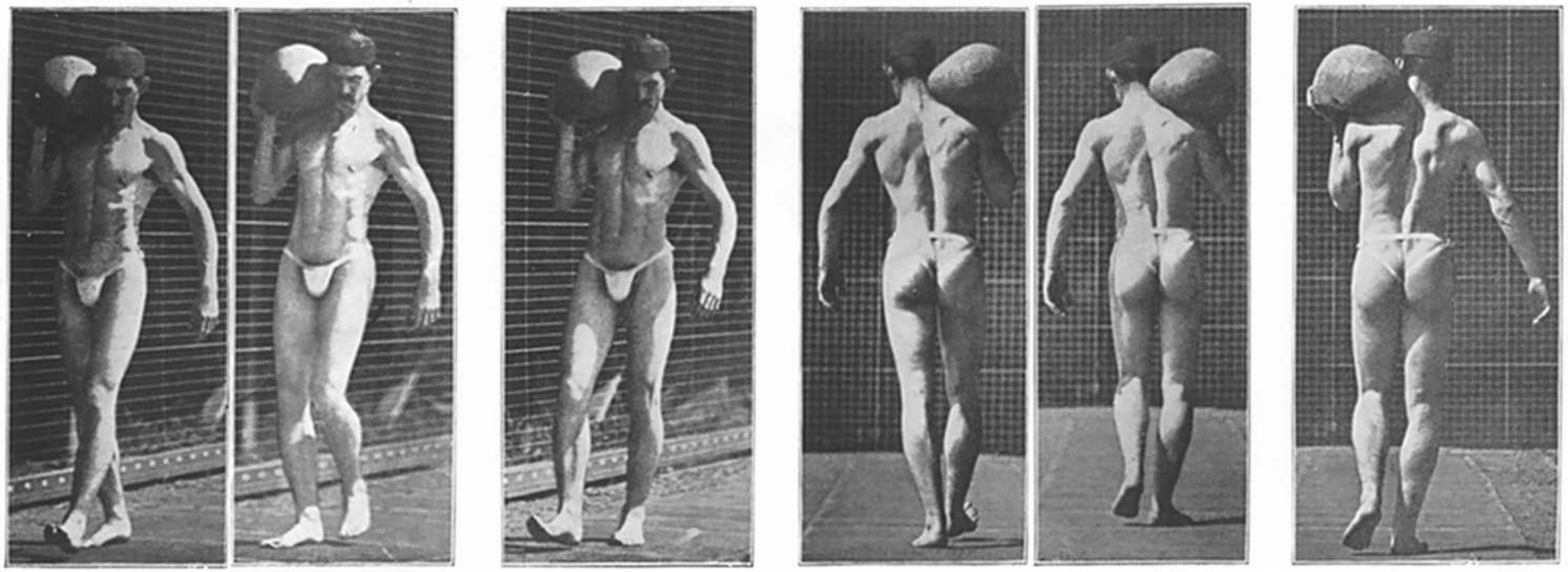
See Series 2.



Copyright, 1887, by Eadweard Muybridge.]

"SOME PHASES IN THE WALK OF AN ATHLETE. CARRYING A 75-POUND BOULDER.

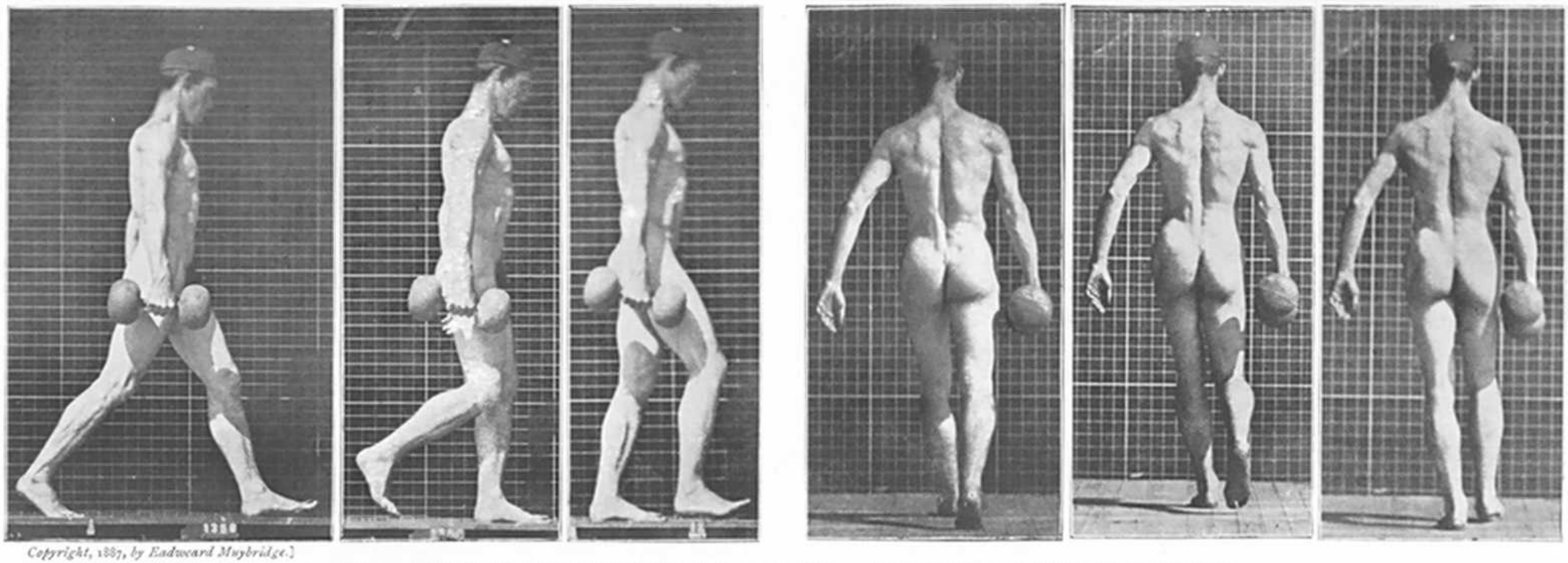
Model 46. See Series 3.



Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES IN THE WALK OF AN ATHLETE. CARRYING A 75-POUND BOULDER.

Model 46. See Series 3.

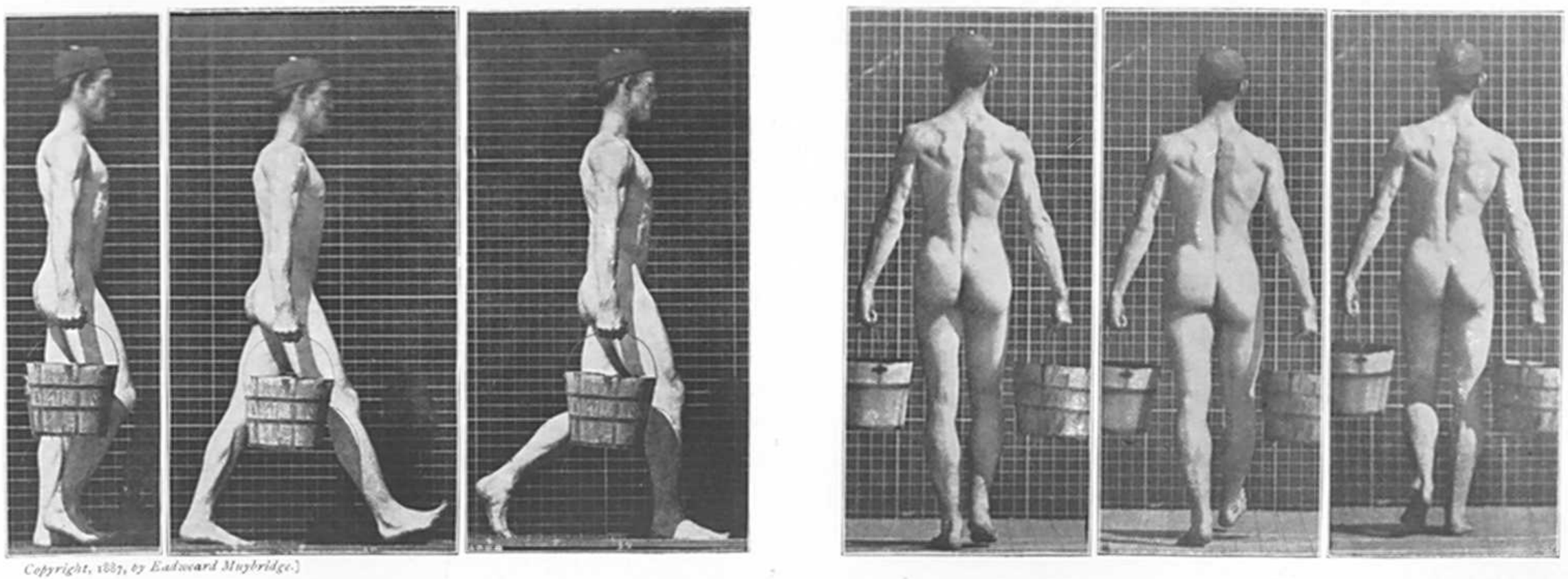


Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES IN THE WALK OF AN ATHLETE. CARRYING A 50-POUND DUMB-BELL.

Model 46.

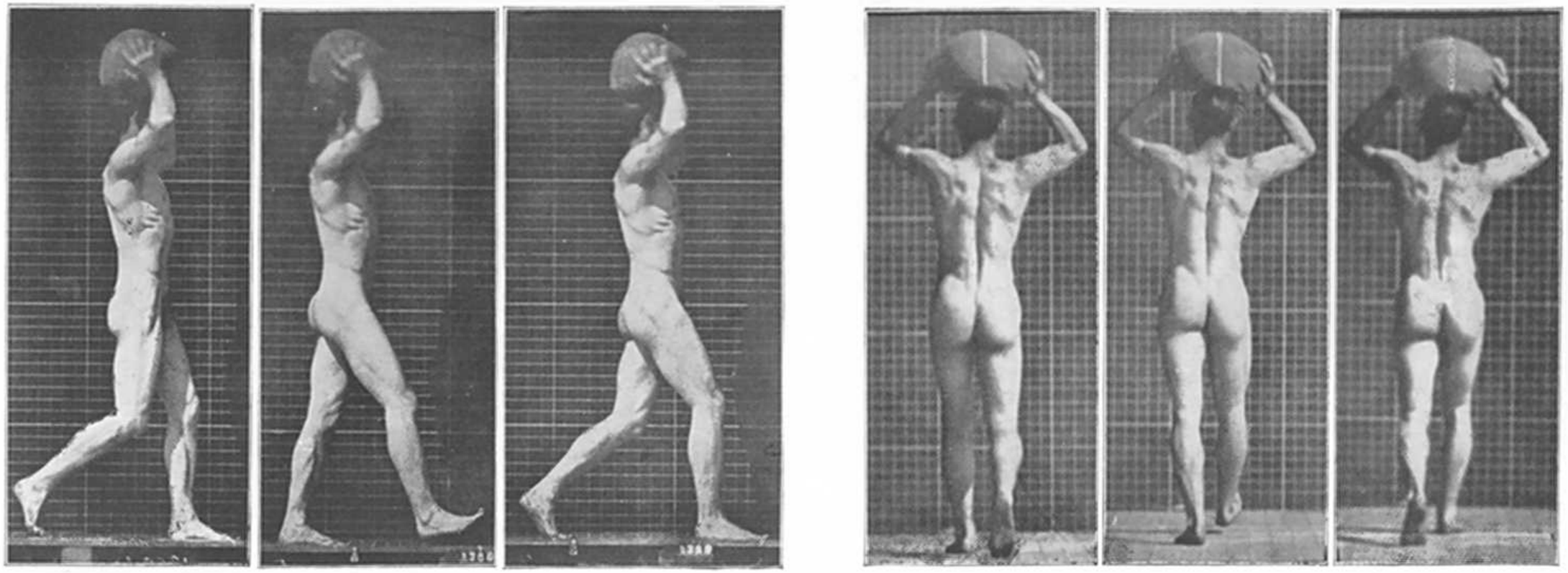
See Series 4.



Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES IN THE WALK OF AN ATHLETE. CARRYING BUCKETS FILLED WITH WATER.

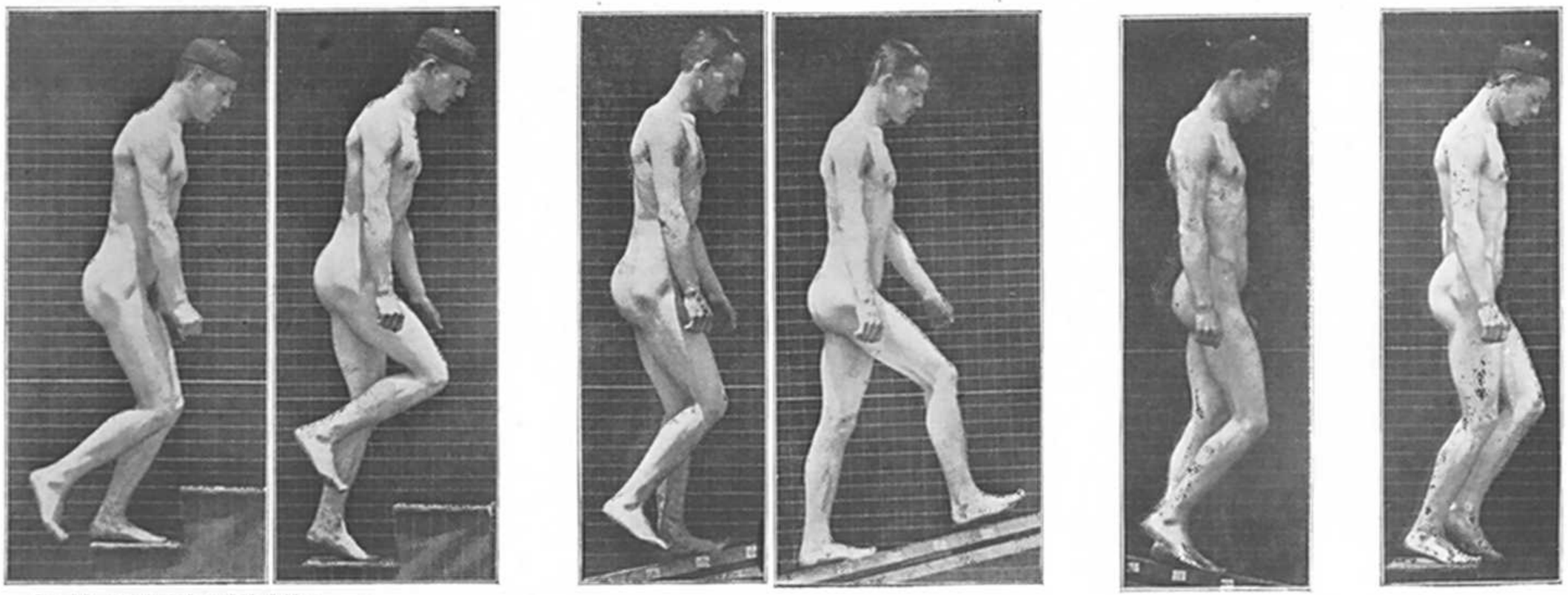
Model 46.



Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES IN THE WALK OF AN ATHLETE. CARRYING A 75-POUND BOULDER.

Model 46.

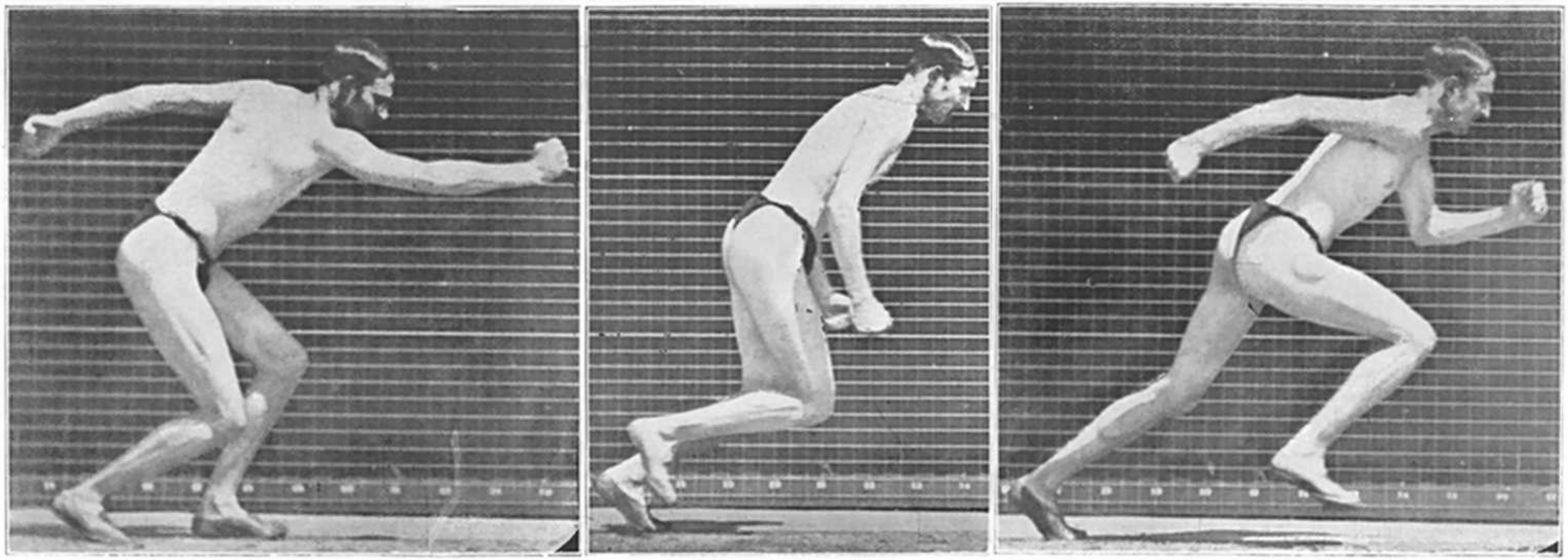


Copyright, 1887, by Eadweard Muybridge.]

WALKING, UNDER VARIOUS CONDITIONS.

Model 36.

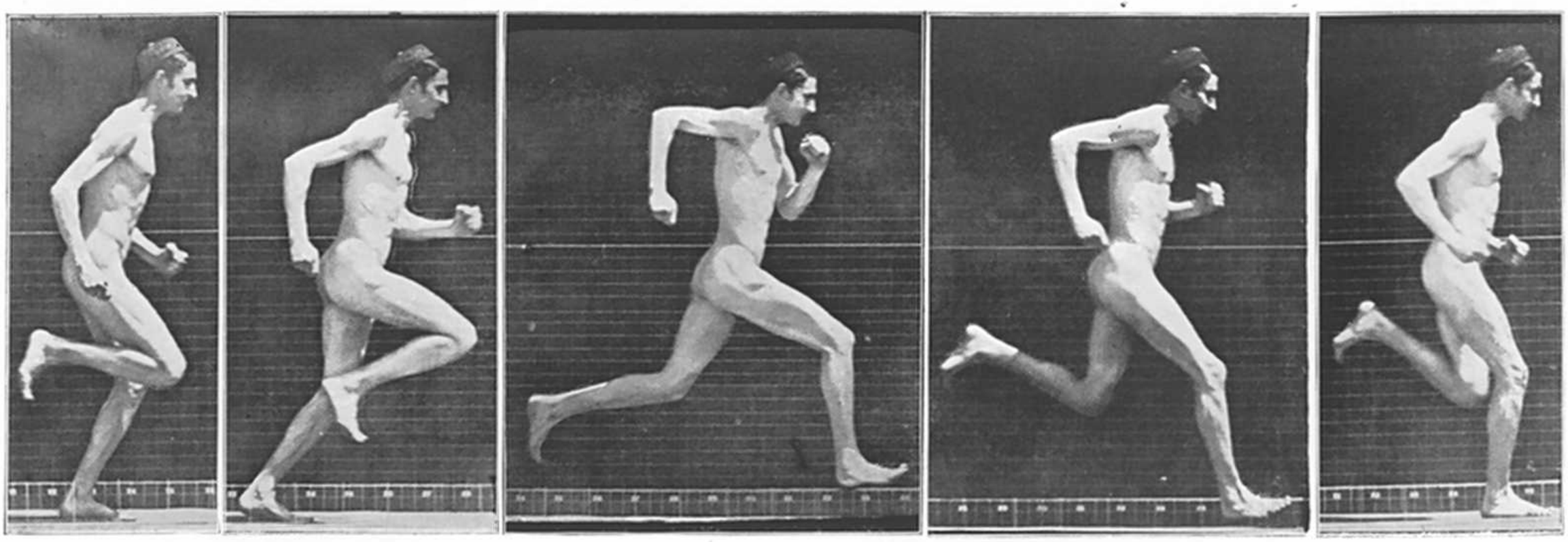
See Seriates 5, 6, and 7.



Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES OF STARTING FOR A RACE.

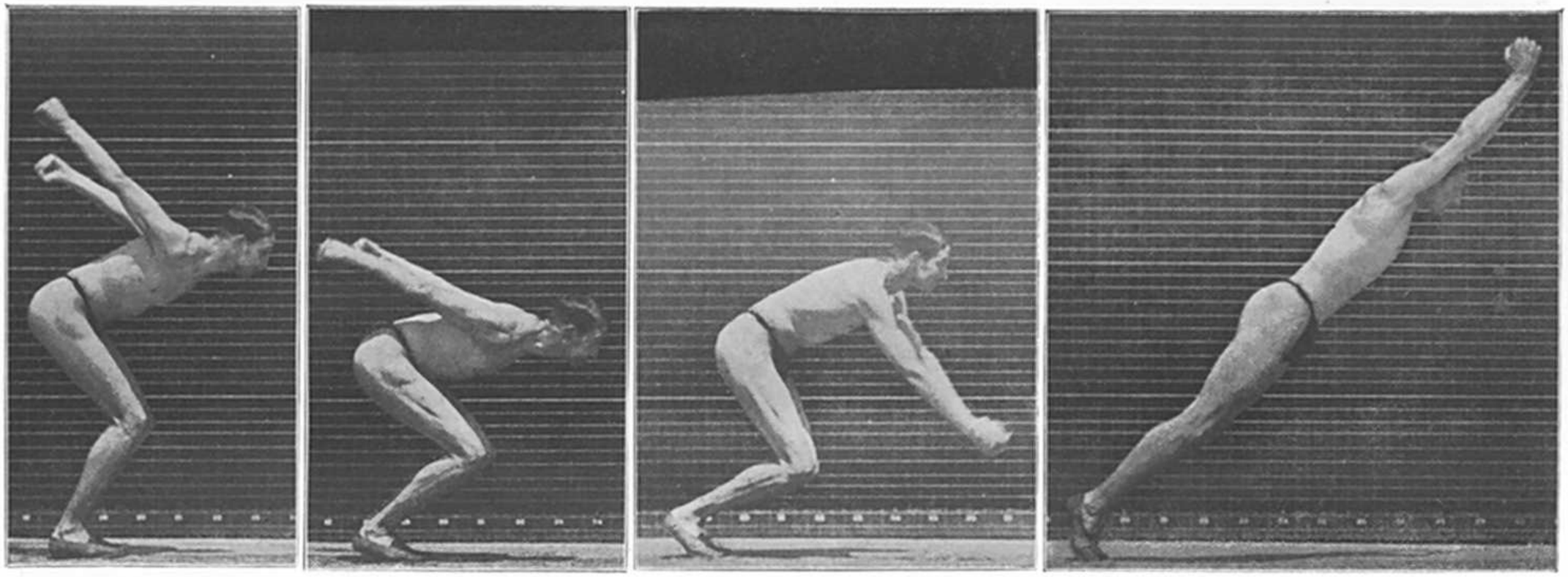
Model 37. See Series 9.



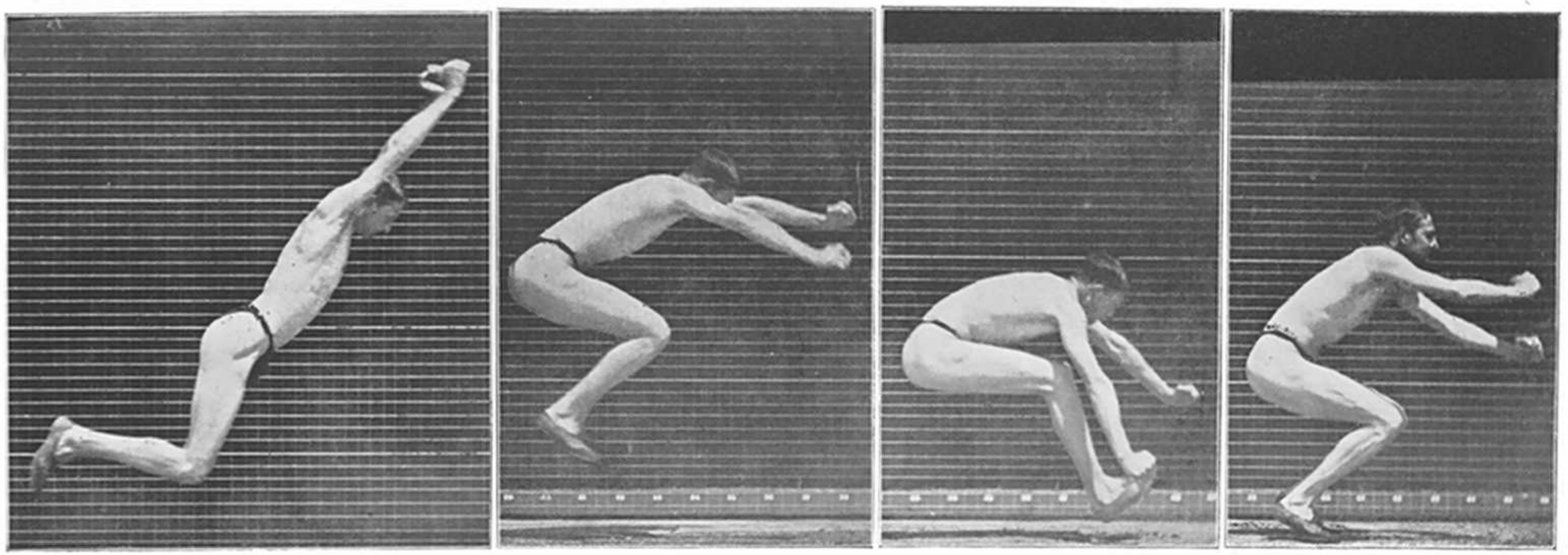
Copyright,' 1887,' by Eadweard Muybridge.]

SOME PHASES OF RUNNING A RACE.

Model 37. See Series 10.



Copyright, 1887, by Eadweard Muybridge.]

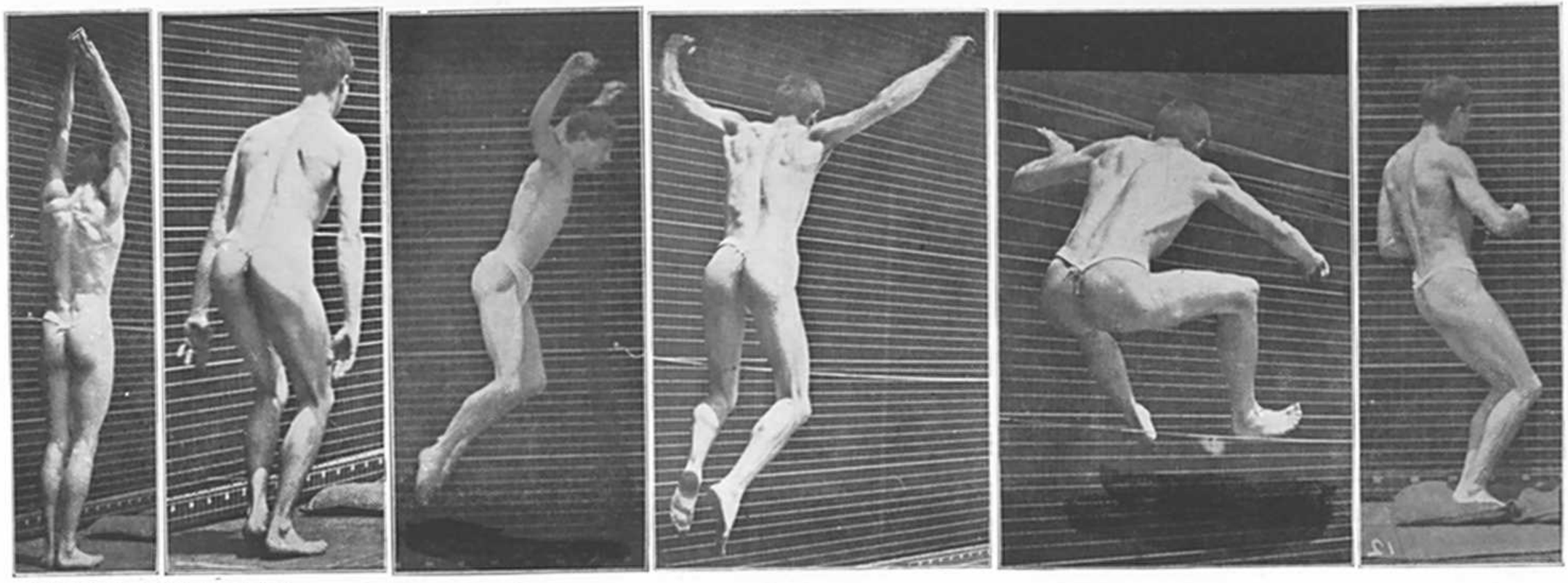


Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES OF A STANDING LONG-JUMP.

Model 37.

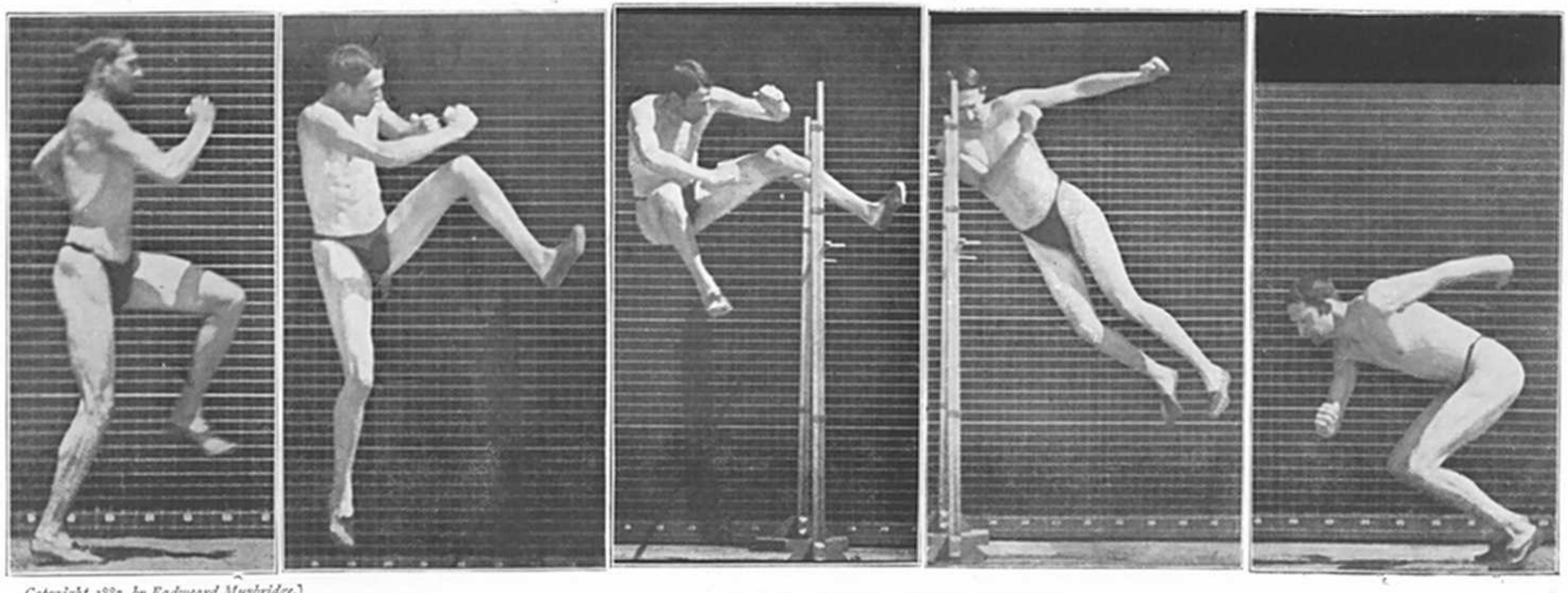
See Series 13.



Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES OF A STANDING HIGH-JUMP.

Model 40. See Series 14.

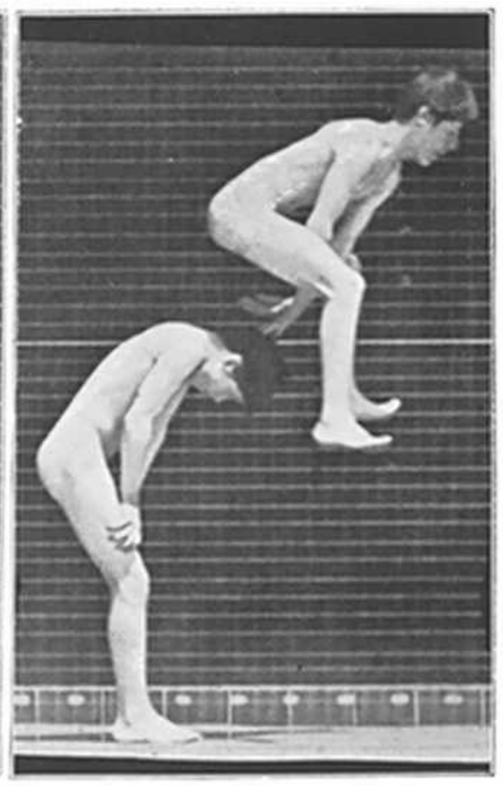


Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES OF RUNNING HIGH-JUMPS.

Model 37. See Seriates 15, 16, and 17.

Copyright, 1887, by Eadweard Muybridge.]



Copyright, 1887, by Eadweard Muybridge.]

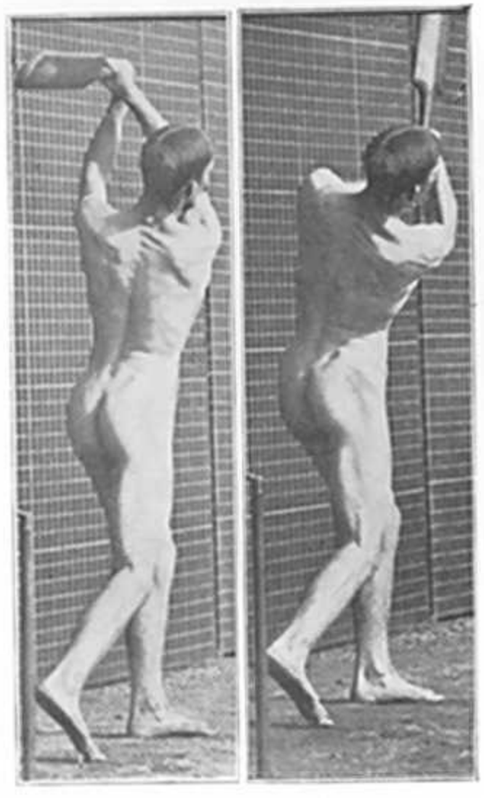
SOME PHASES OF RUNNING AND JUMPING.

Models 27, 28, 37, 47, 97.

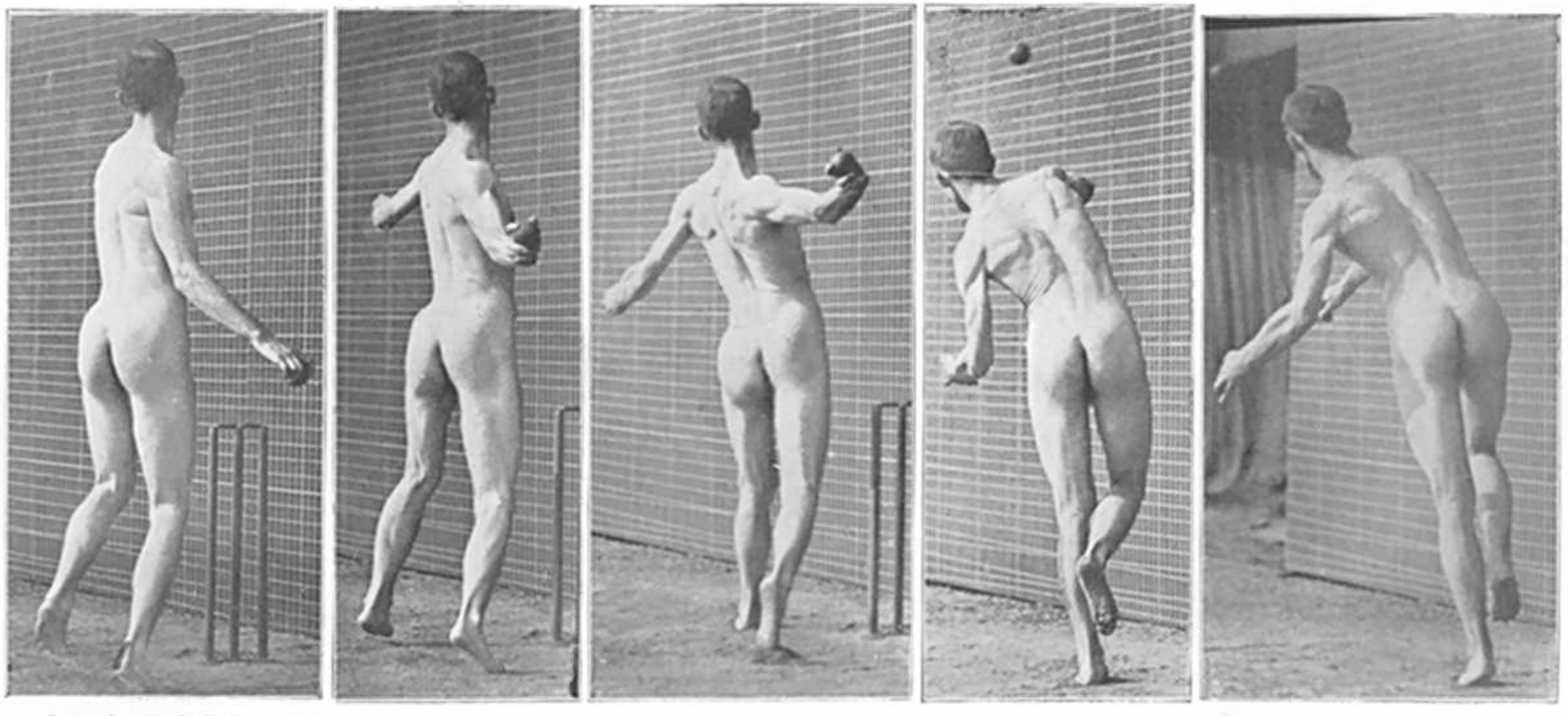
Copyright, 1887, by Eadweard Muybridge.]

CRICKET.

CRICKET.



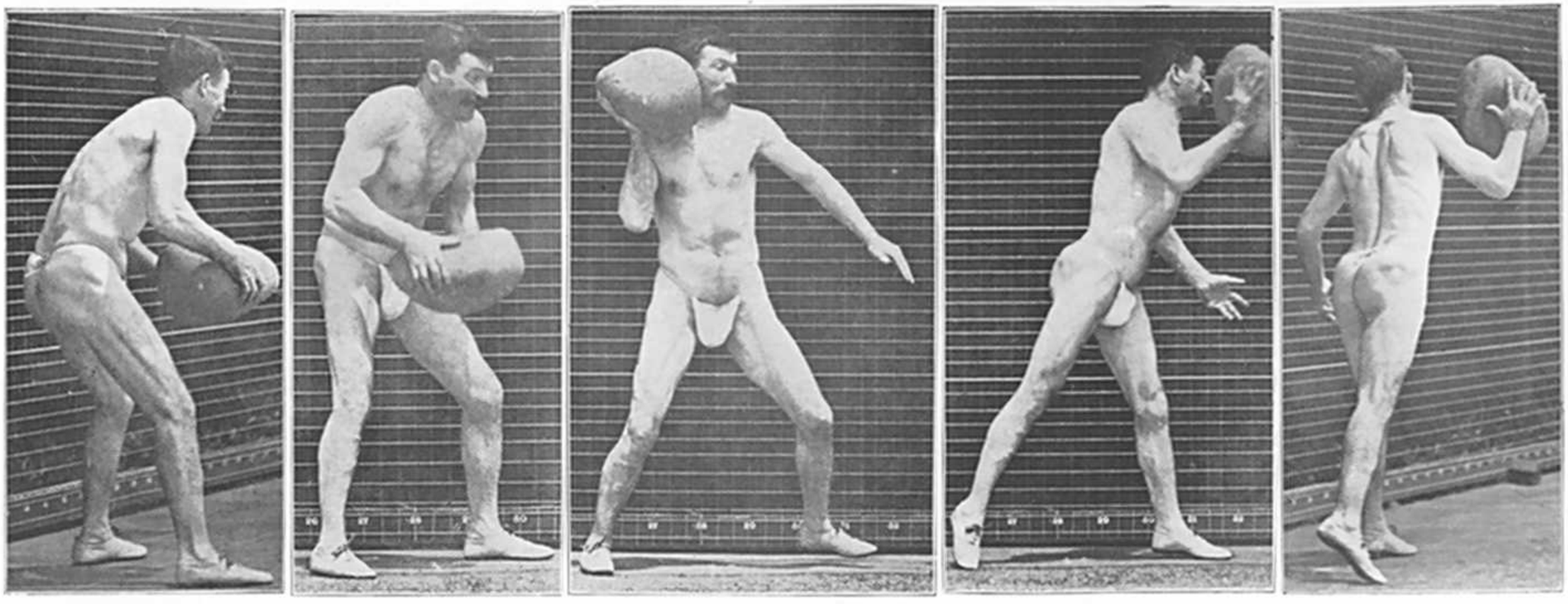
CRICKET.



Copyright, 1887, by Eadweard Muybridge.]

CRICKET.

See Seriates 22, 23, and 27.



Copyright, 1887, by Eadweard Muybridge.]

HEAVING A 75-POUND BOULDER.

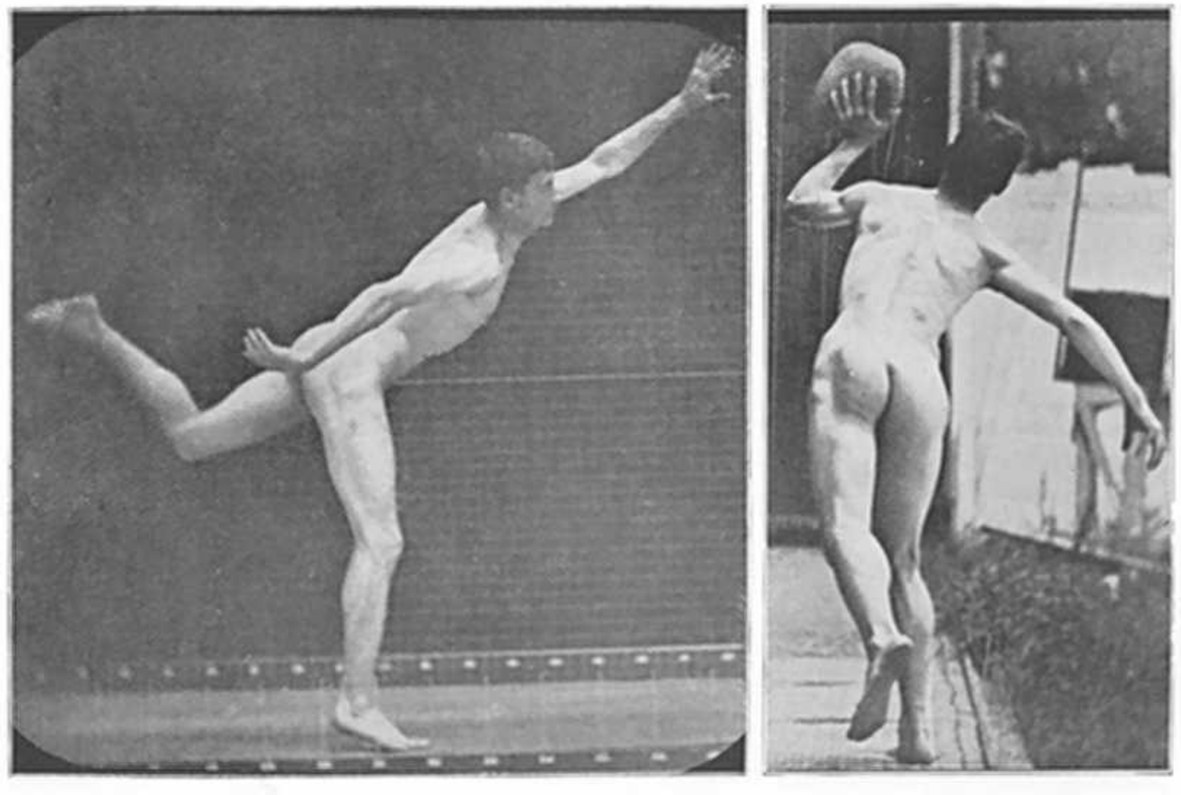
Model 52.

See Series 25.

Copyright, 1887, by Eadweard Muybridge.]

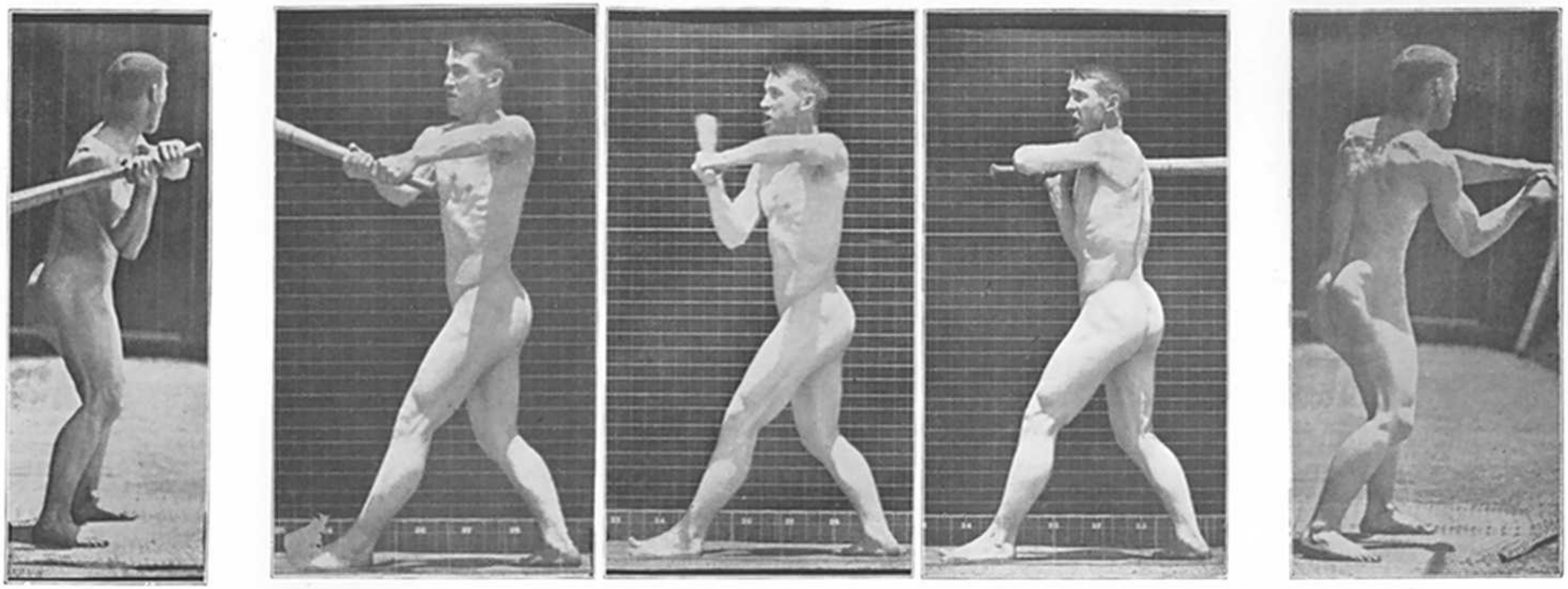
HEAVING A 75-POUND BOULDER.

Model 52.



HEAVING A 20-POUND BOULDER.

Model 35.



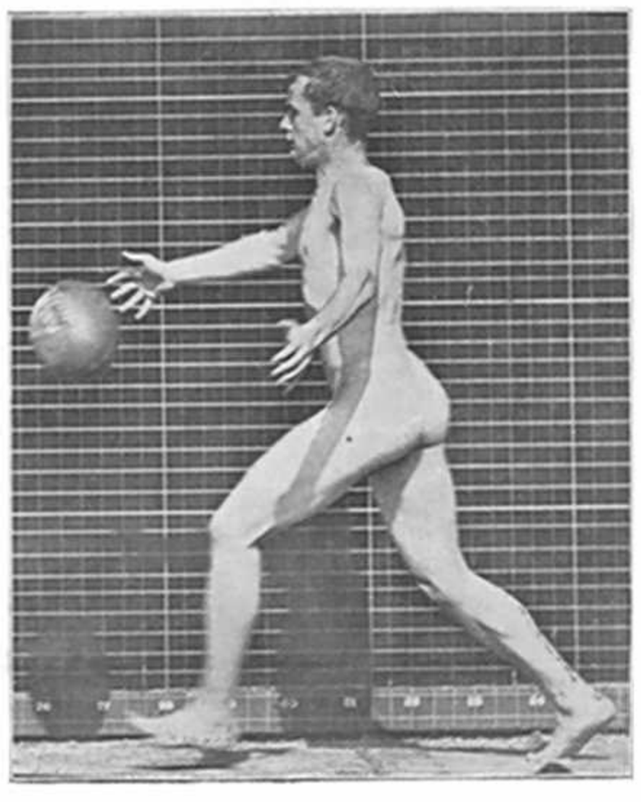
Copyright, 1887, by Eadweard Muybridge.]

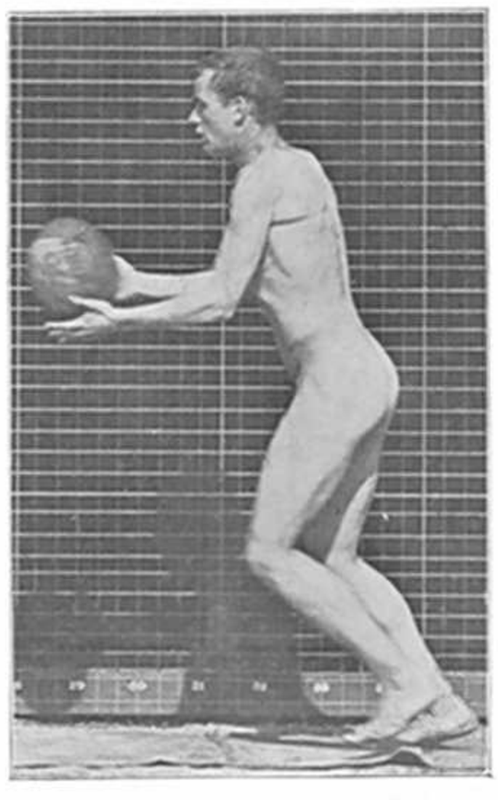
PHASES IN BATTING AT BASEBALL.

Model 30.

See Series 26.

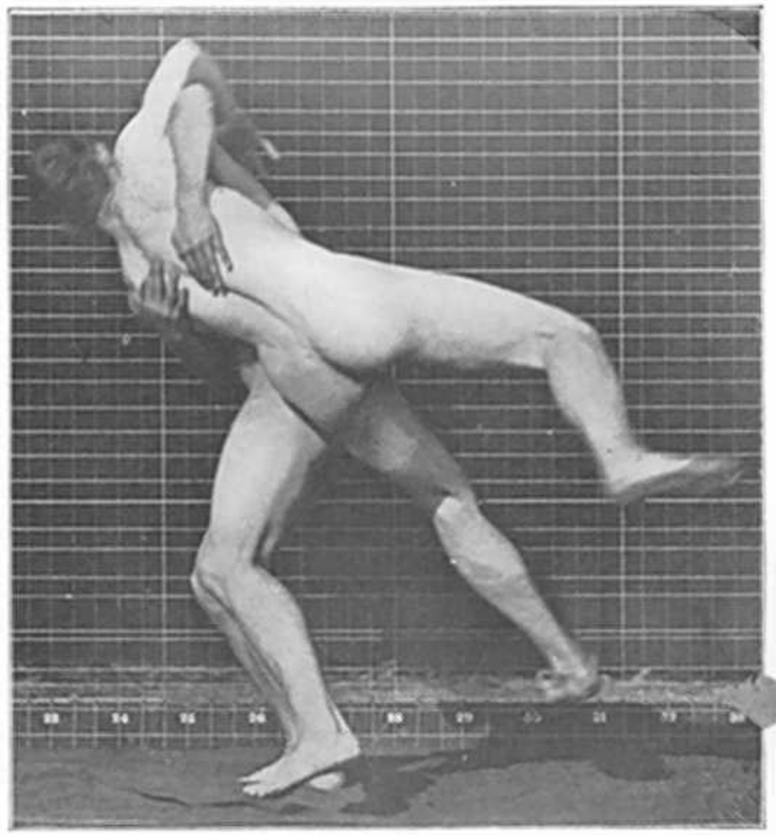
Copyright, 1887, by Eadweard Muybridge.]





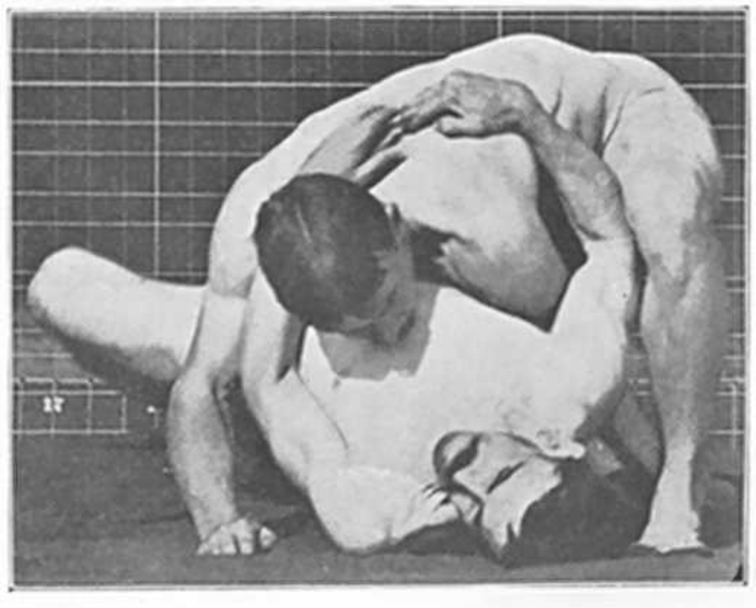
PHASES AT FOOTBALL.

Model 63.



Copyright, 1887, by Eadweard Muybridge.]

Copyright, 1887, by Eadweard Muybridge.]

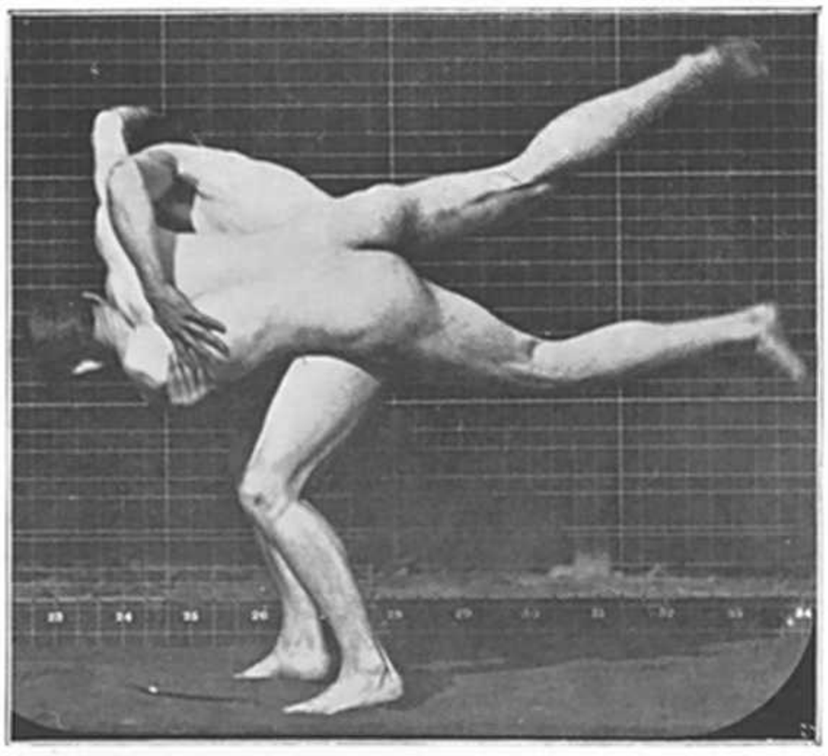


Models 46 and 68.

SOME PHASES IN A WRESTLING MATCH.

See Series 30.

Copyright, 1887, by Eadweard Muybridge.]

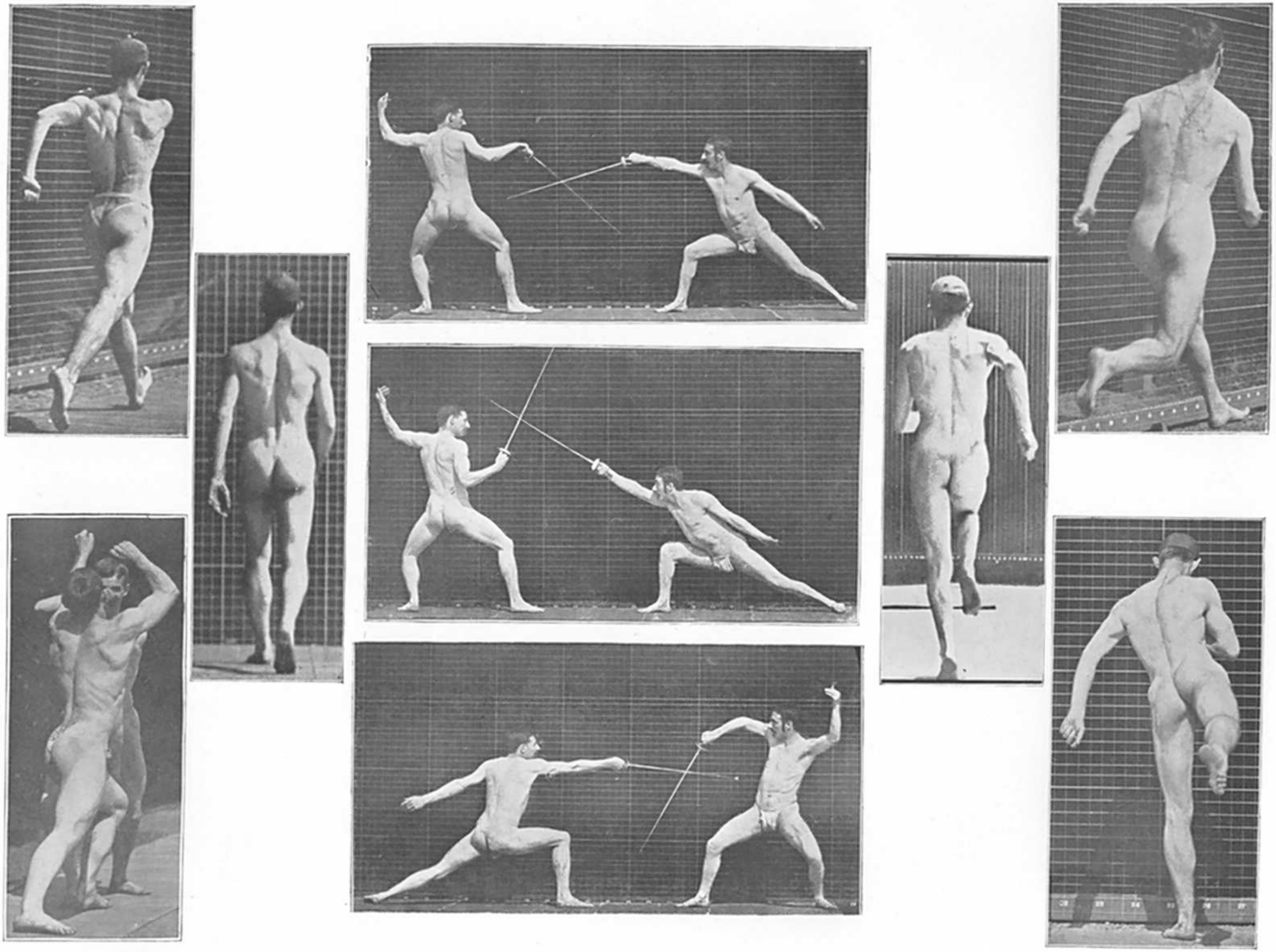


Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES IN A WRESTLING MATCH.

Models 46 and 68.

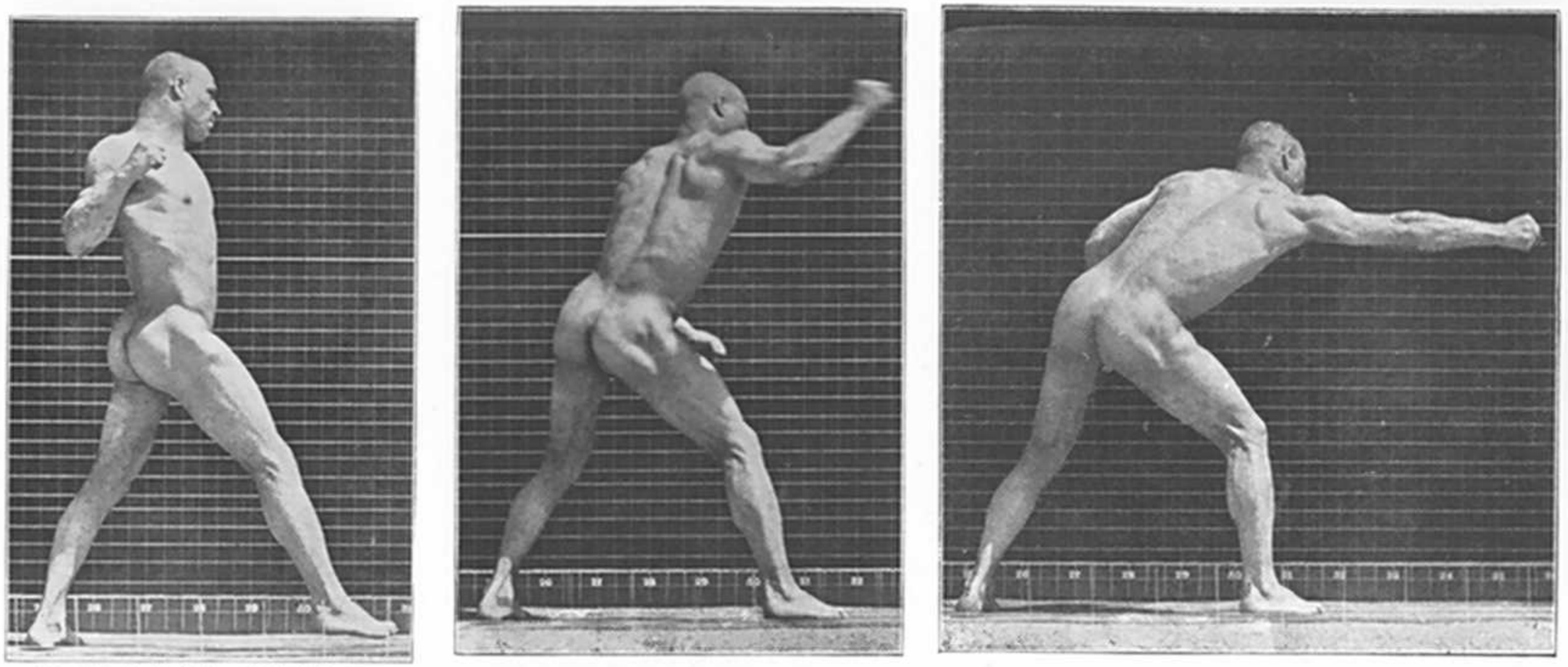
See Series 30.



Copyright, 1887, by Eadweard Muybridge.]

PHASES OF MOTION, SELECTED FROM VARIOUS SERIATES.

Models 37, 46, 55, 66, 67, 99, and 101.



Copyright, 1887, by Eadweard Muybridge.]

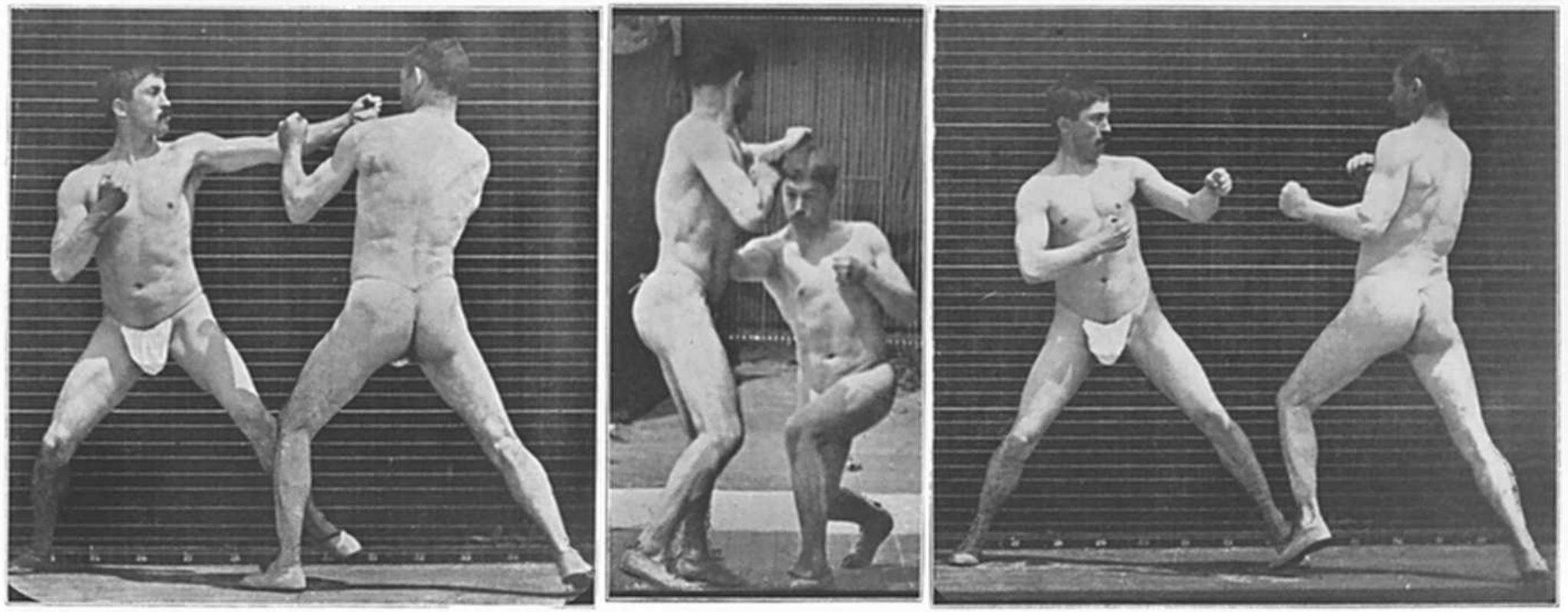
SOME PHASES OF A PUGILIST STRIKING A BLOW.

Model 22. See Series 32.

Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES OF A BOXING MATCH.

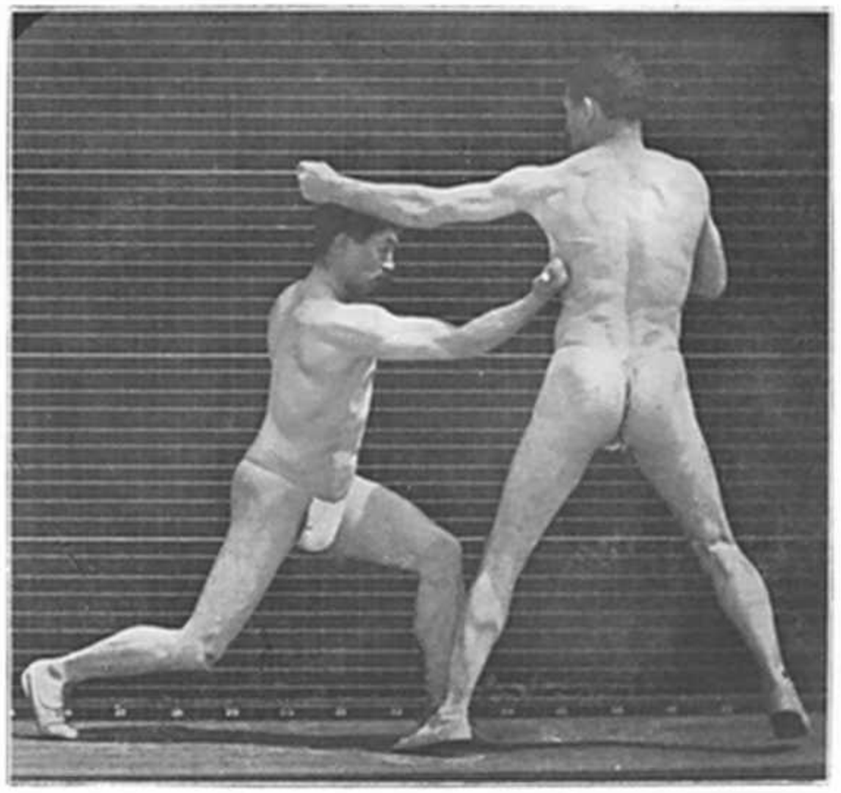
Models 52 and 53.



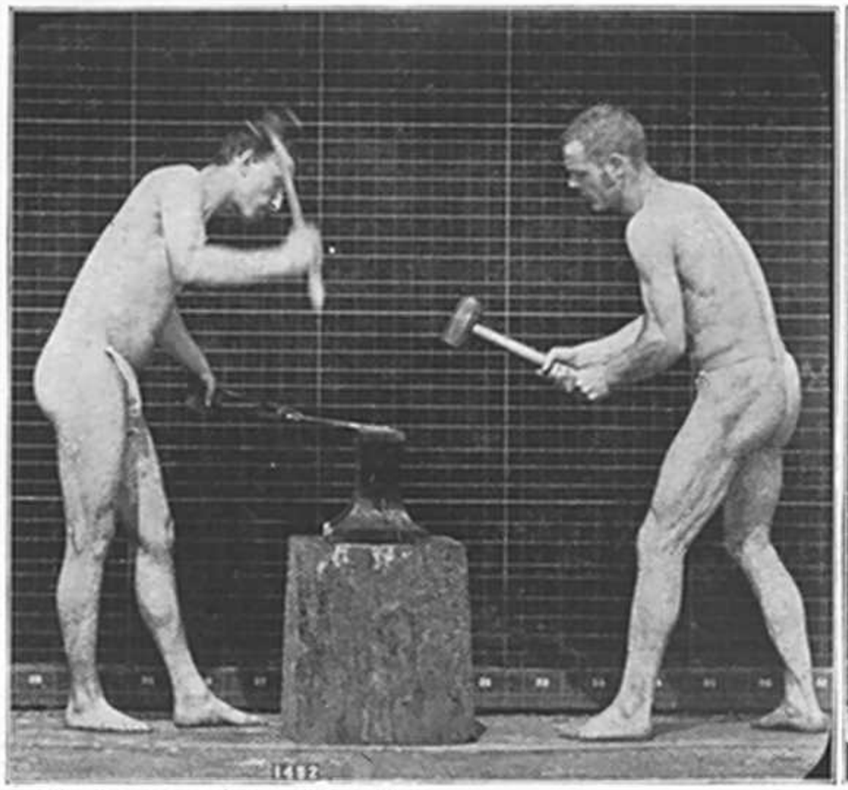
Copyright, 1887, by Eadweard Muybridge.]

Copyright, 1887, by Eadweard Muybridge.]

Models 52 and 53.

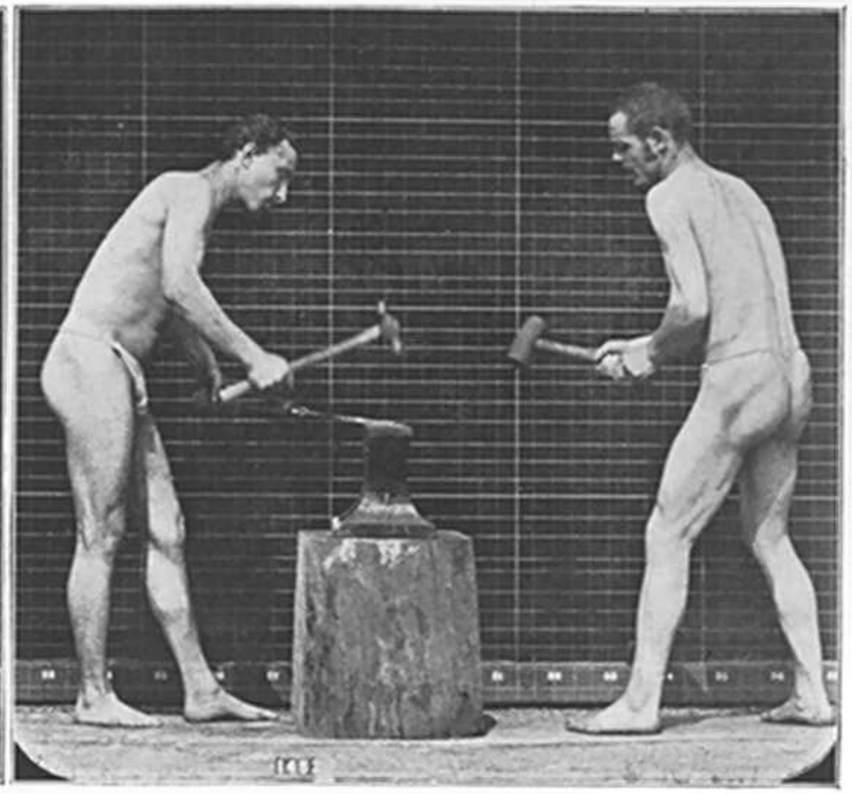


SOME PHASES OF A BOXING MATCH.



Copyright, 1887, by Eadweard Muybridge.]

2



3

Copyright, 1887, by Eadweard Muybridge.]

4

7

BLACKSMITHS AT WORK.

IN PHASE 2 THE SLEDGE-HAMMER HAS REBOUNDED.

Models 59 and 61.

See Series 37.

Copyright, 1887, by Eadweard Muybridge.

10

12

BLACKSMITHS AT WORK.

IN PHASE 12 THE SLEDGE-HAMMER IS DESCENDING.

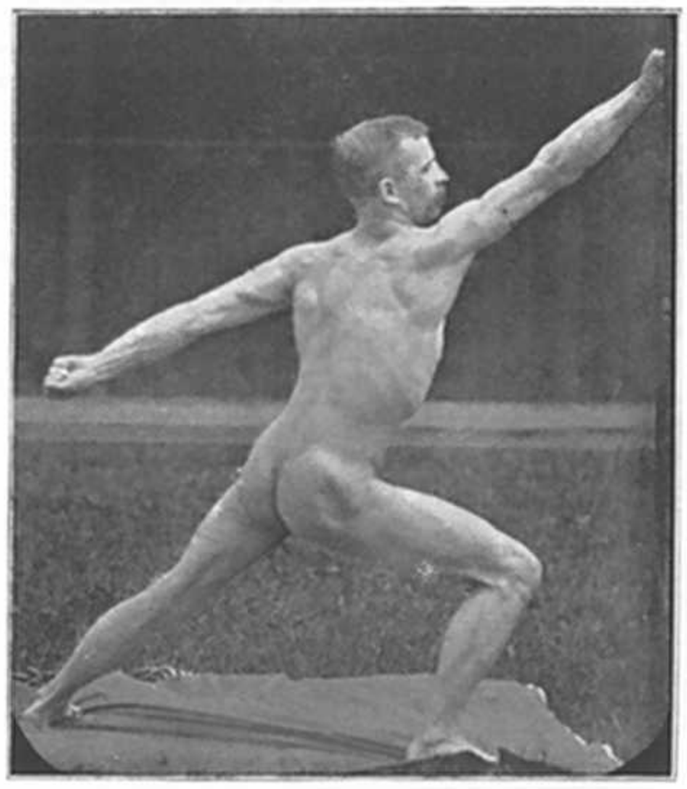
Models 59 and 61.

See Series 37.

Copyright, 1887, by Eadweard Muybridge.]

BASEBALL (LOW BALL).

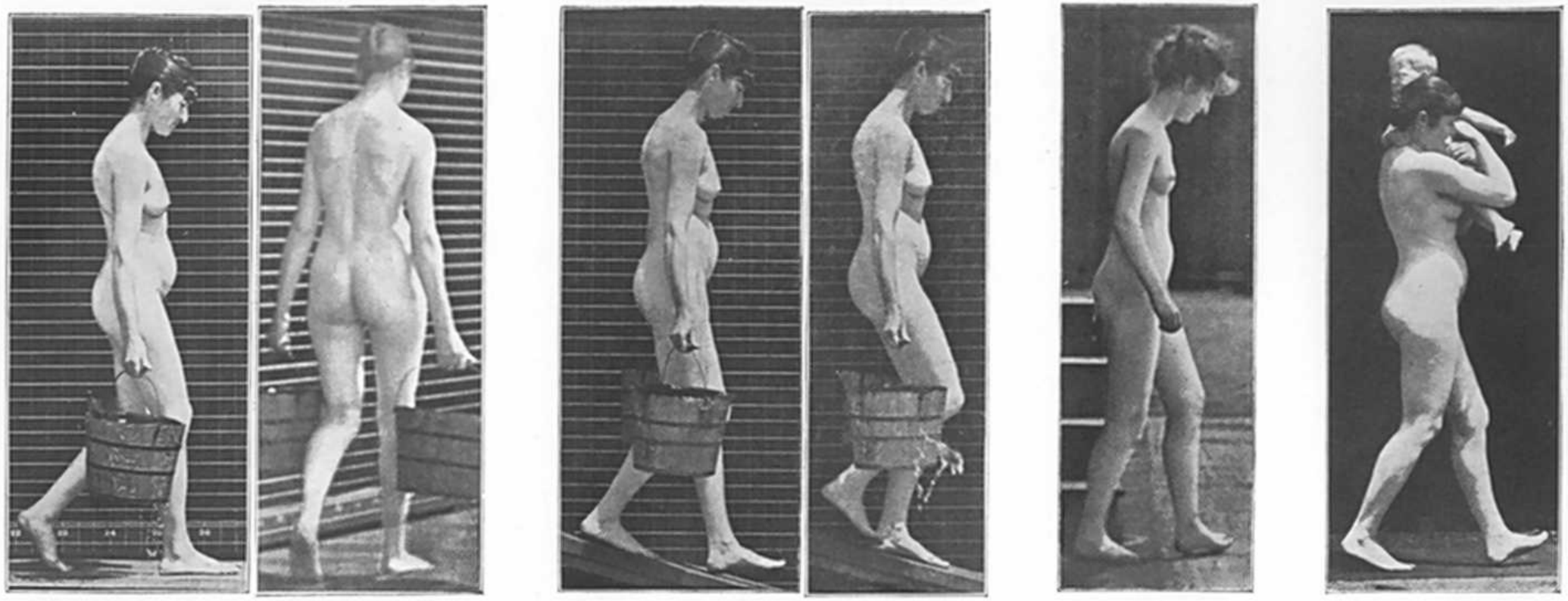
Model 30.



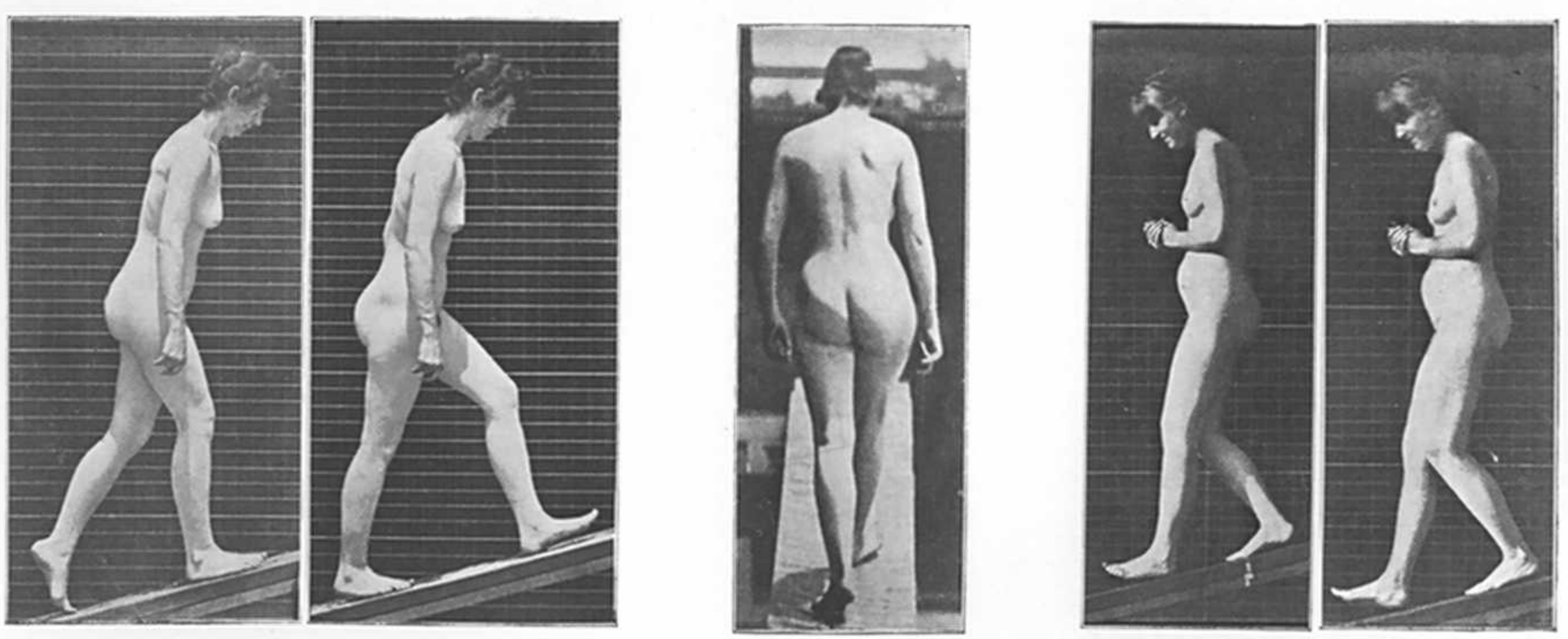
Model 98.

BASEBALL (ERROR).

Model 30.



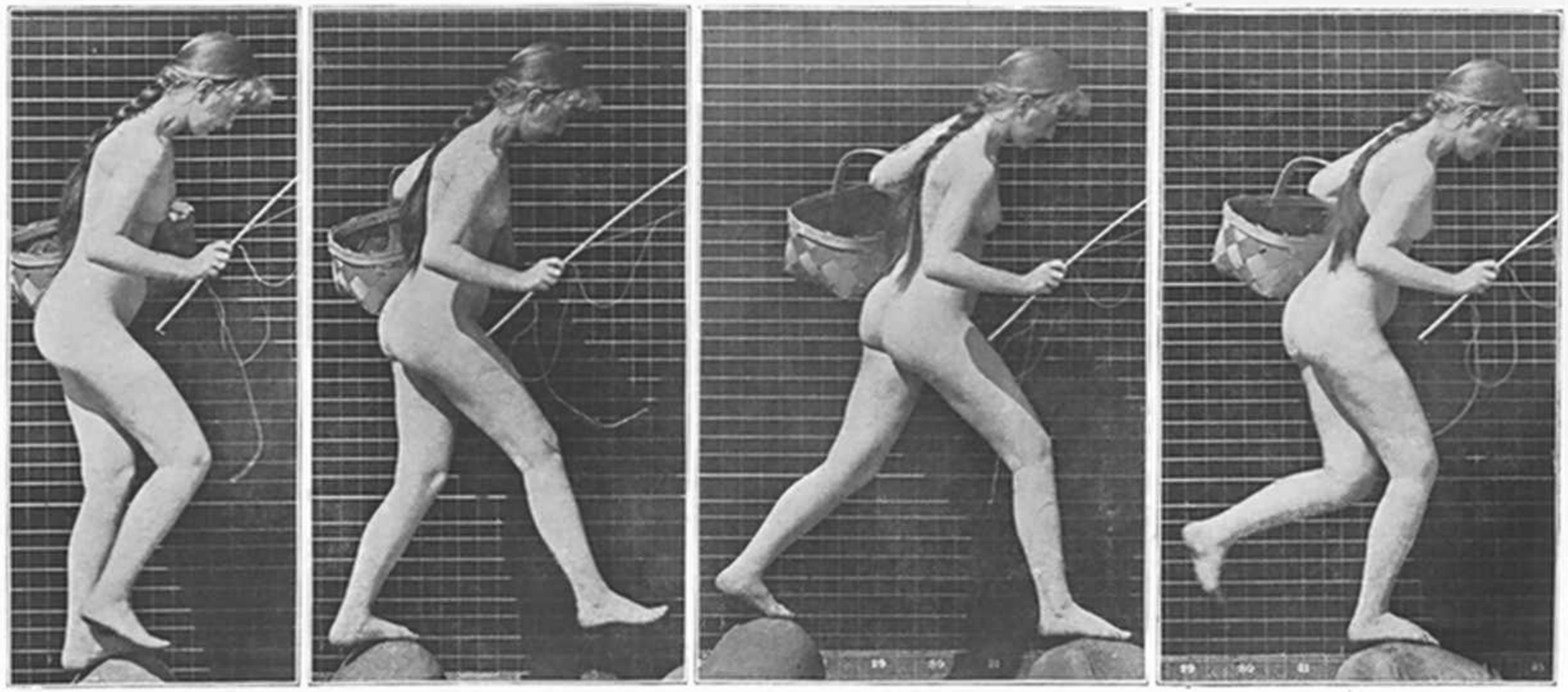
Copyright, 1887, by Eadweard Muybridge.]



Copyright, 1887, by Eadweard Muybridge.]

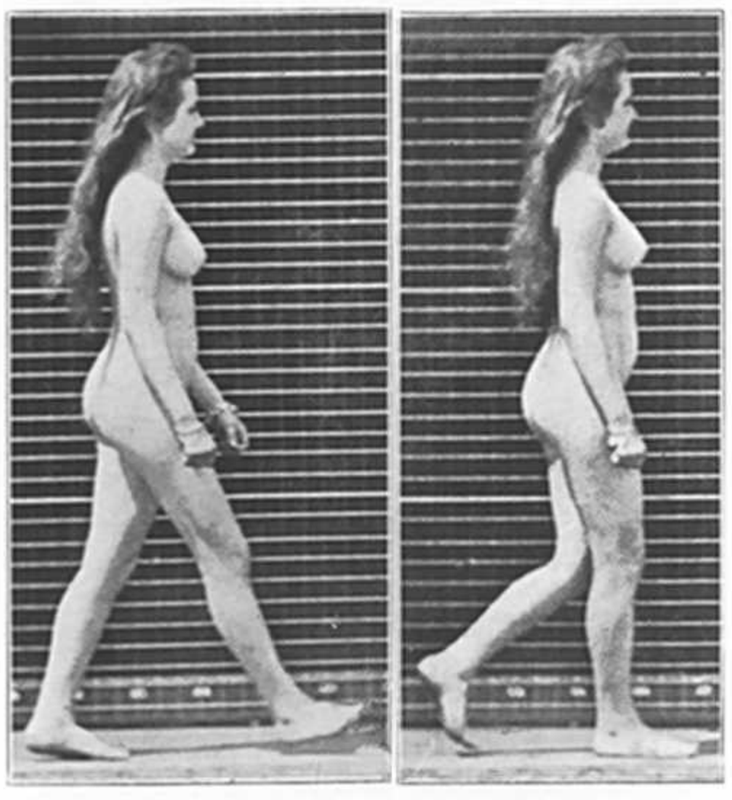
WALKING, UNDER VARIOUS CONDITIONS.

Models 1, 7, and 8.



Copyright, 1887, by Eadweard Muybridge.]

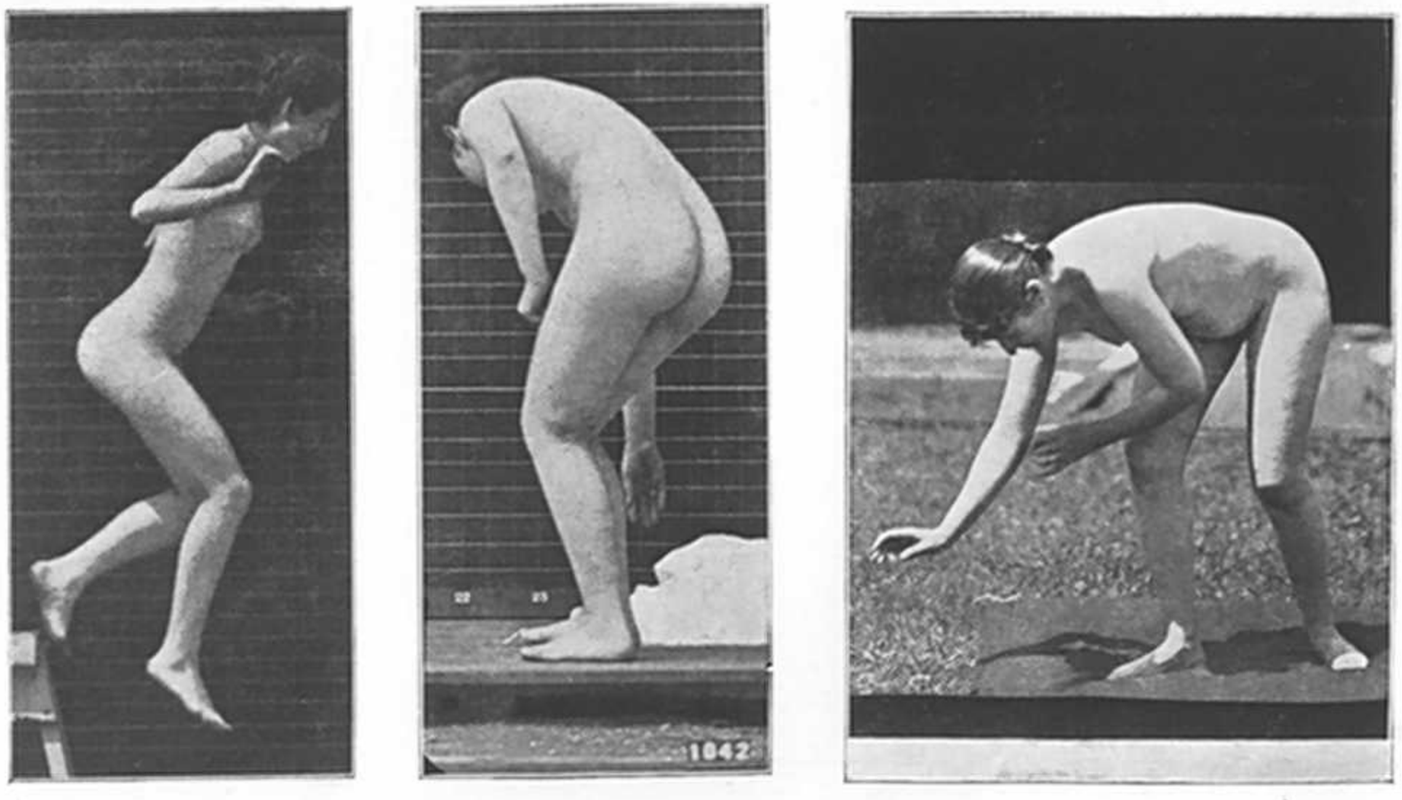
See Series 40.



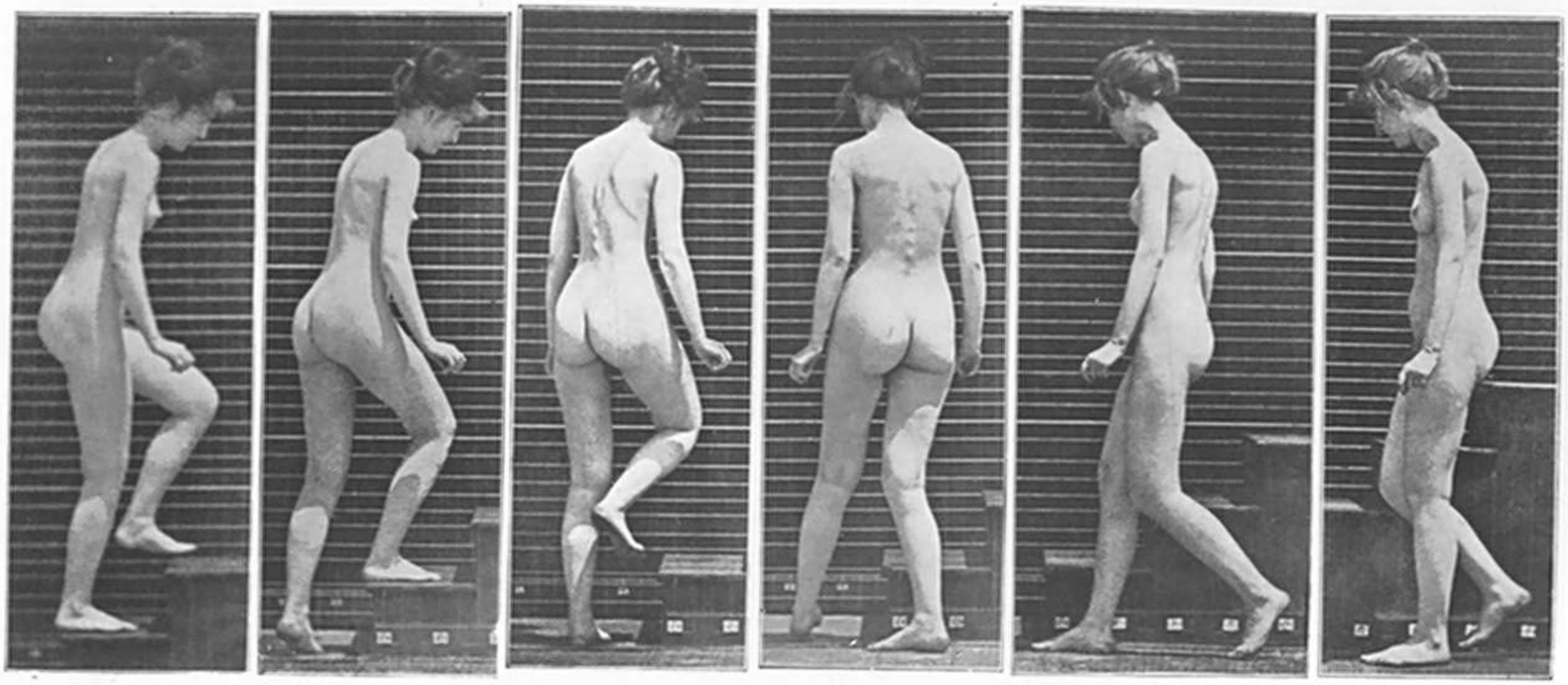
Copyright, 1887, by Eadweard Muybridge.]

See Series 39.

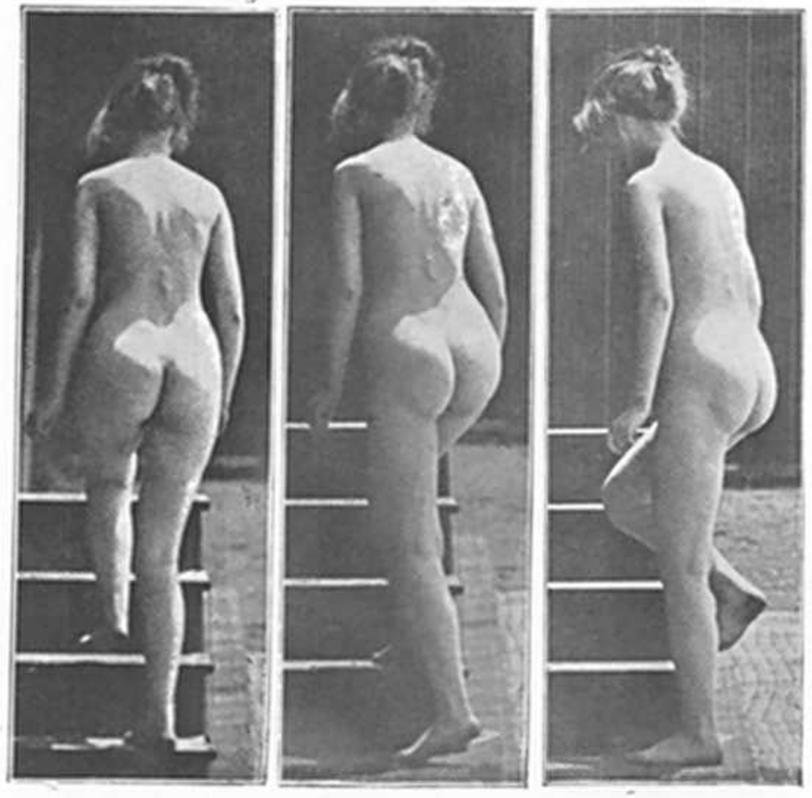
Models 1, 6, 7, 8, and 13.



VARIOUS ACTS OF MOTION.



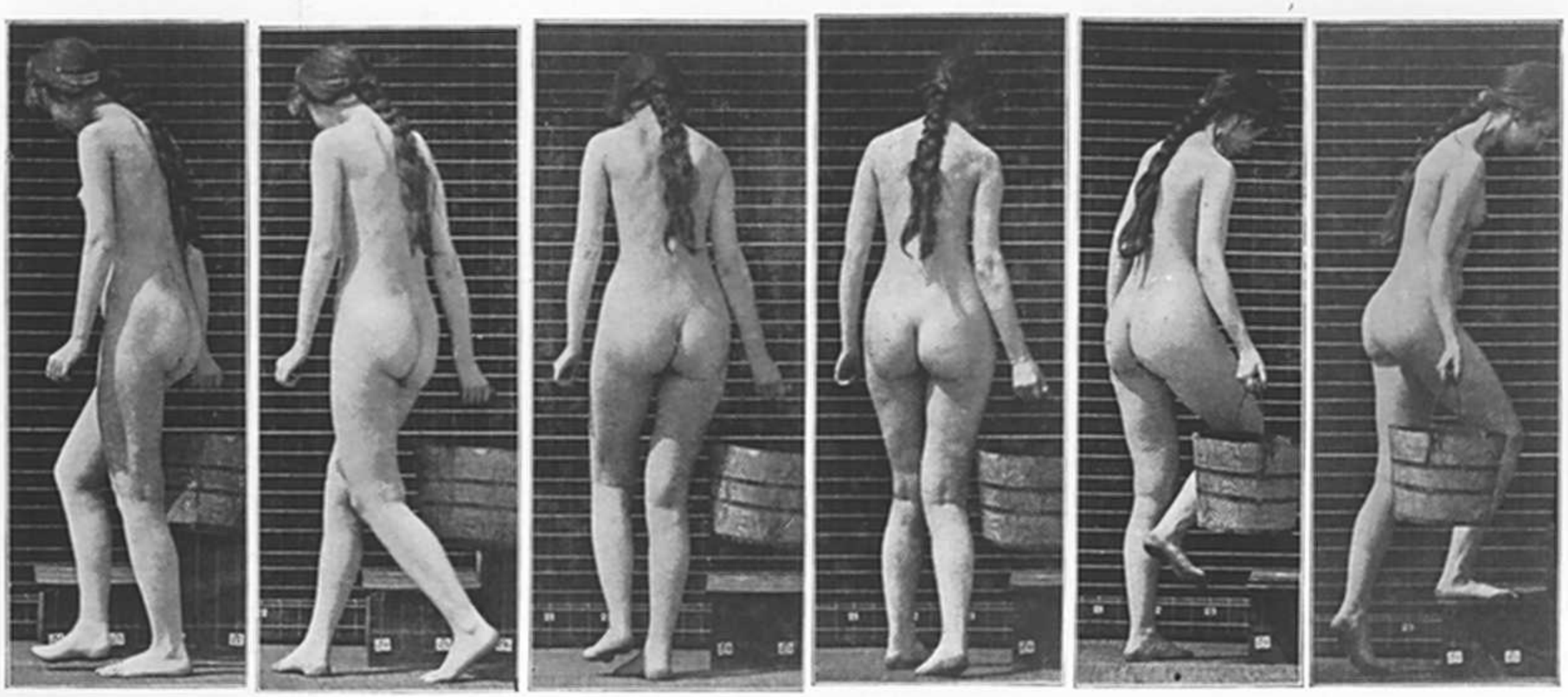
Copyright, 1887, by Eadweard Muybridge.]



Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 41.

Model 7.



Copyright, 1887, by Eadweard Muybridge.]

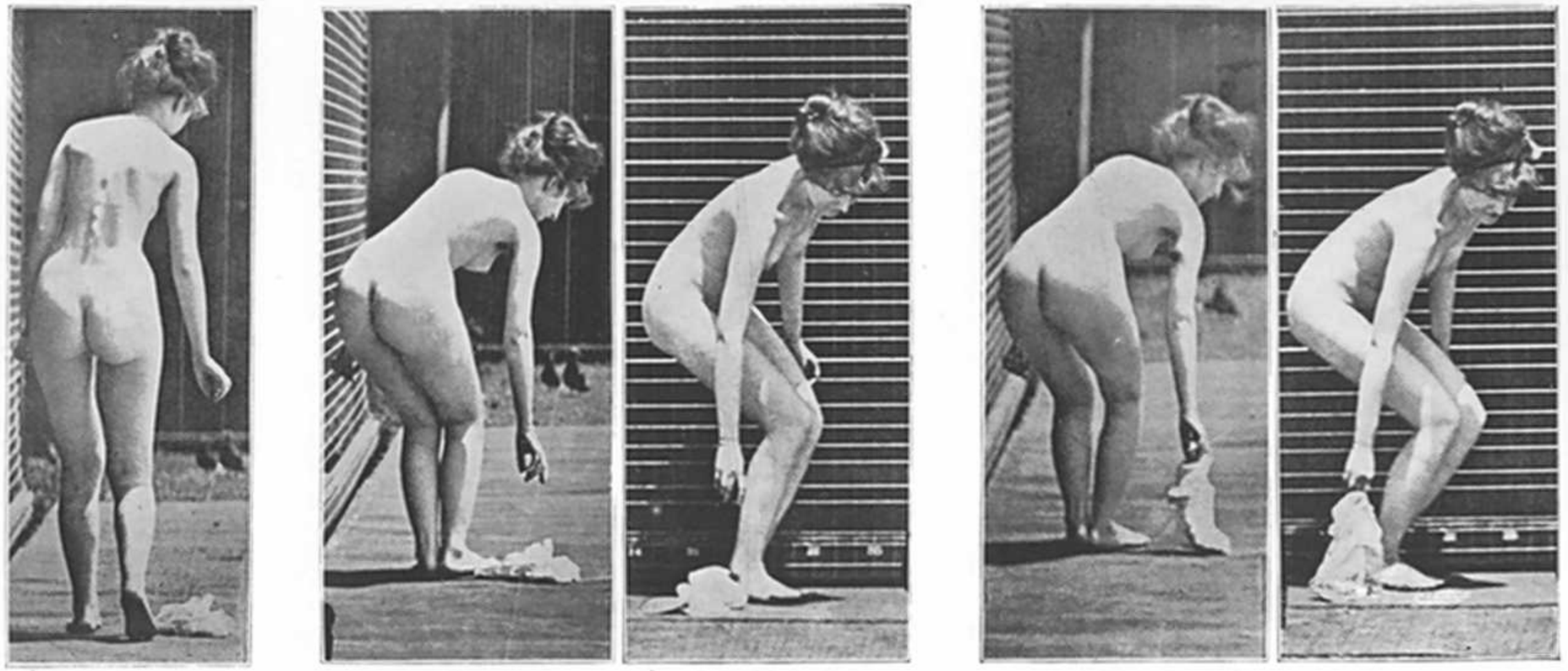
SELECTED PHASES FROM SERIES 42.

Model 7.

Copyright 1887, by Eadweard Muybridge.]

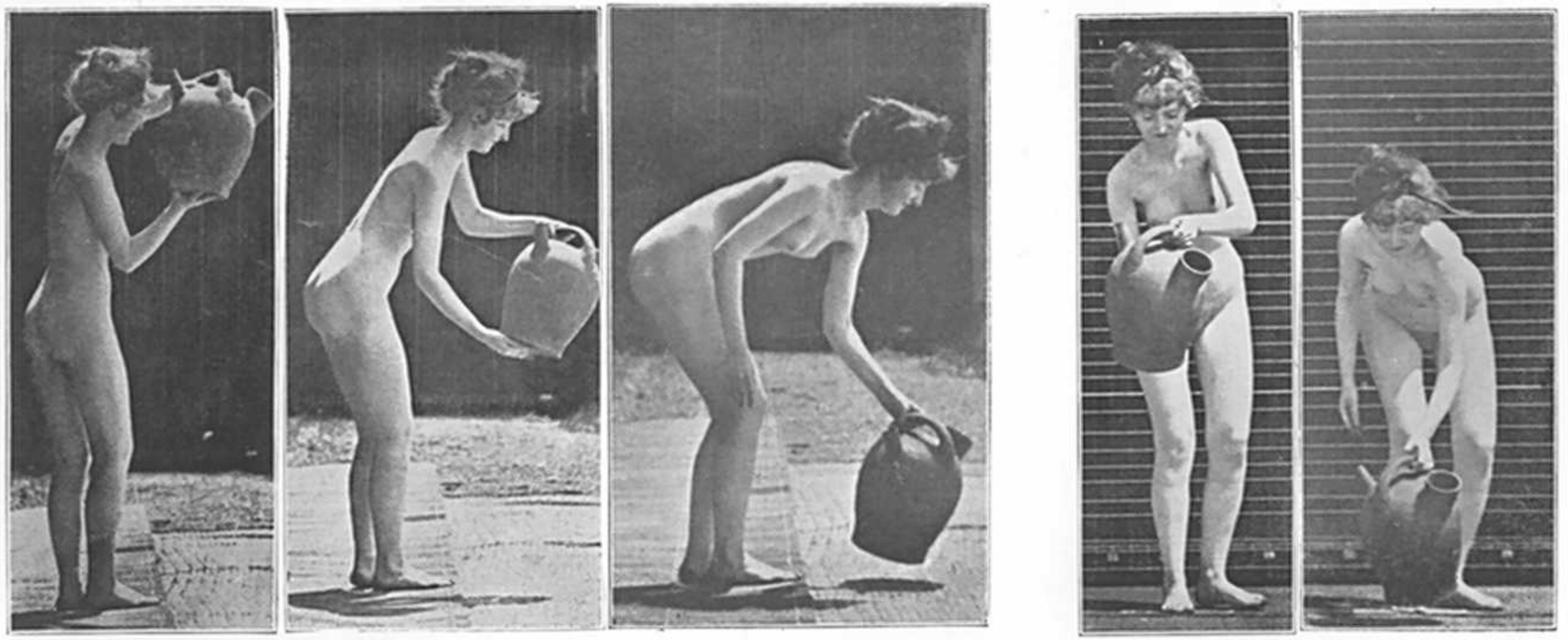
SELECTED PHASES FROM SERIES 43.

Model 8.



Copyright, 1887, by Eadweard Muybridge.]

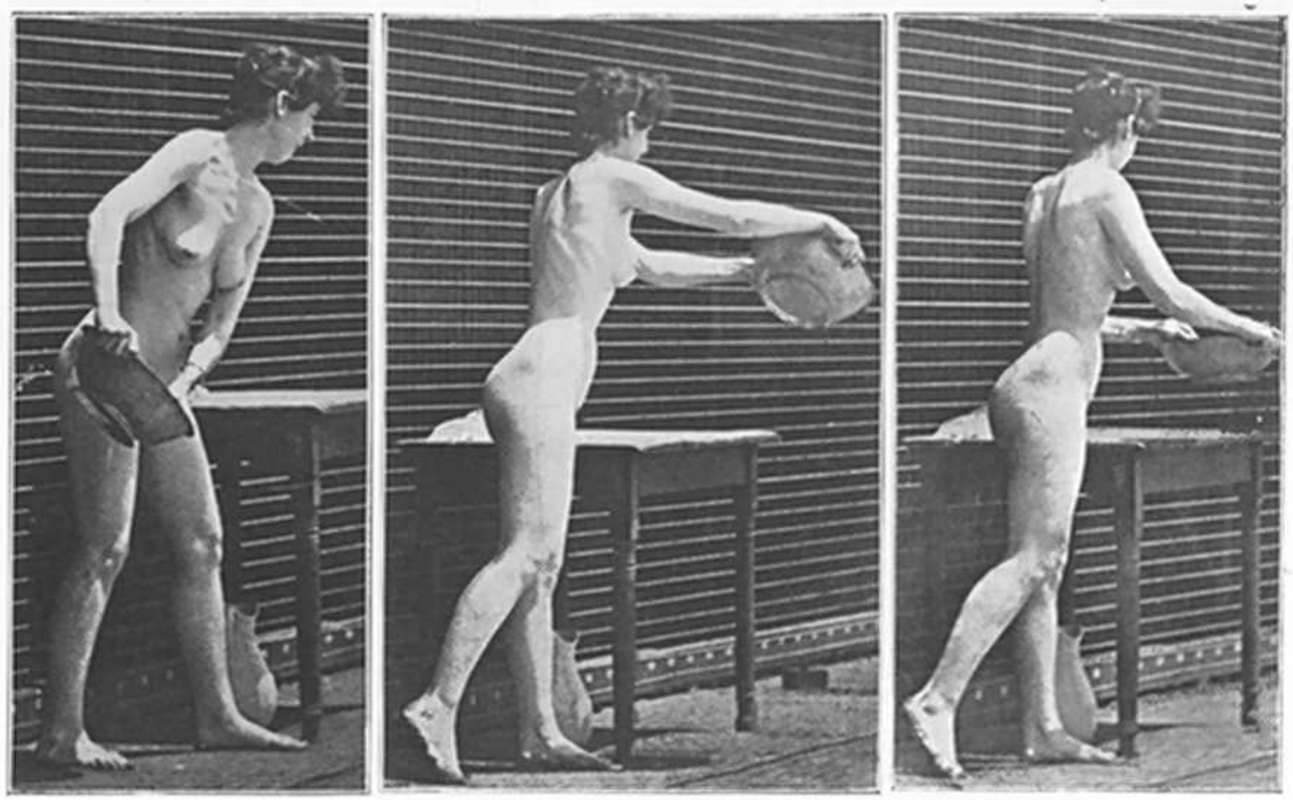
Model 7.



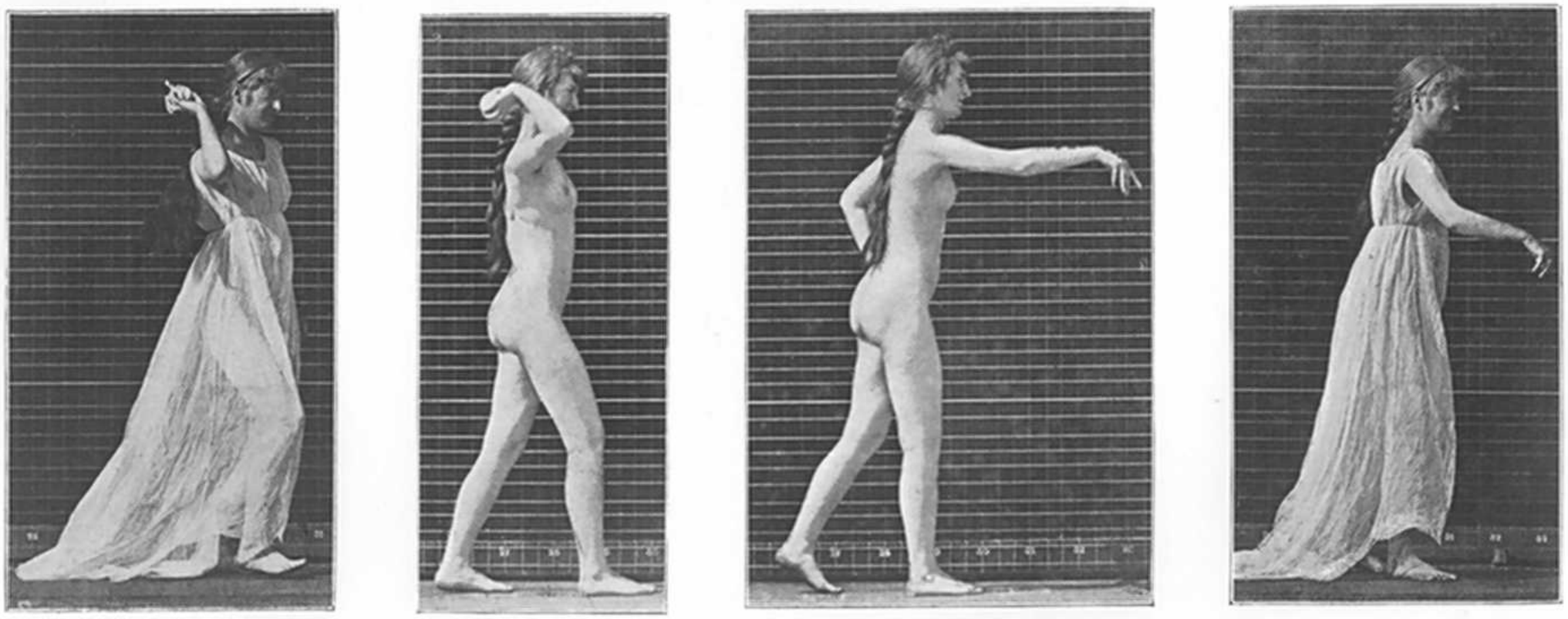
Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES OCCURRING IN THE ACT OF STOOPING.

Model 7.



Copyright, 1887, by Eadweard Muybridge.



Copyright, 1887, by Eadweard Muybridge.]

VARIOUS ACTS OF THROWING.

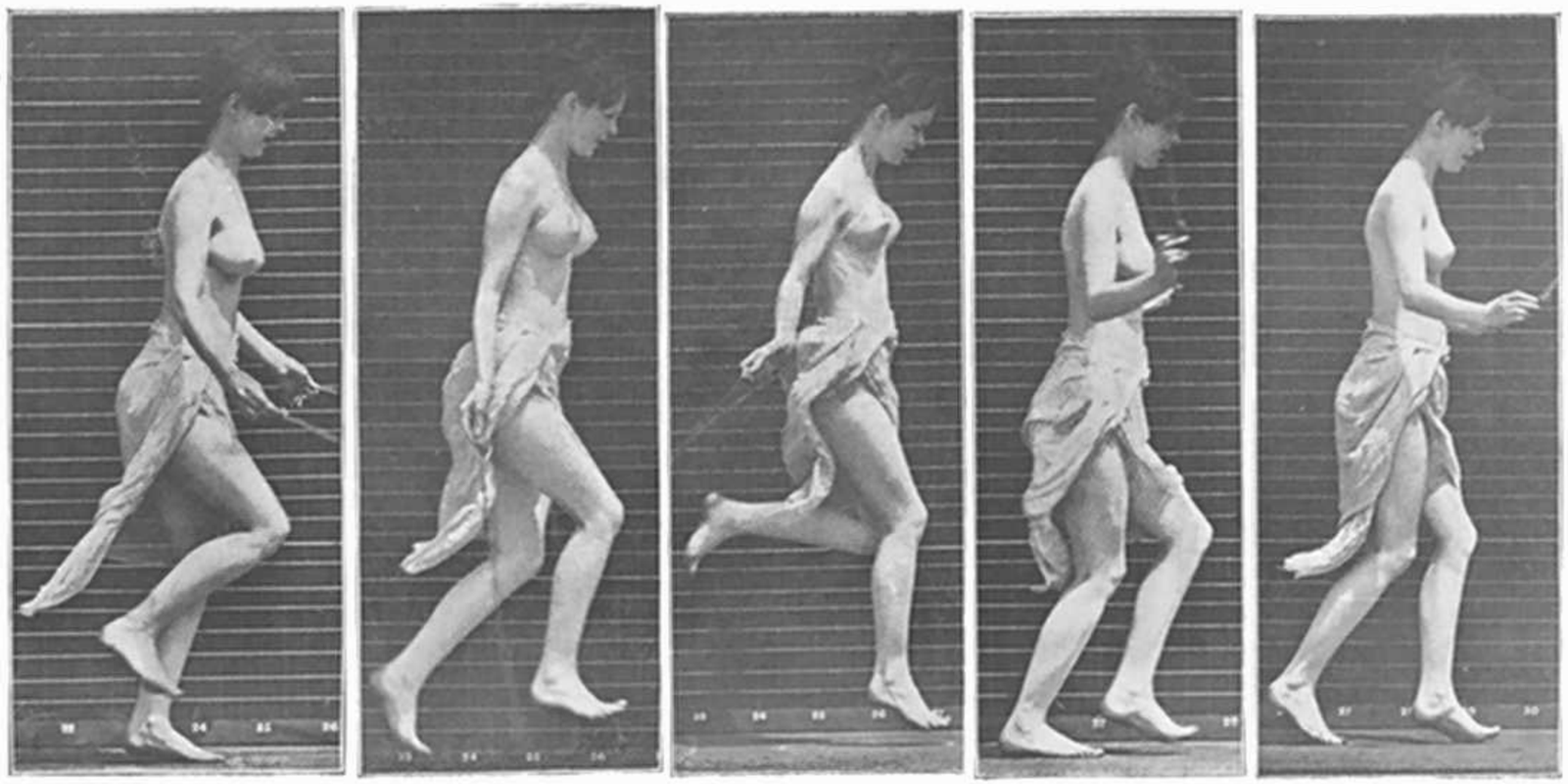
Models 7 and 8.

Copyright, 1887, by Eadweard Muybridge.]

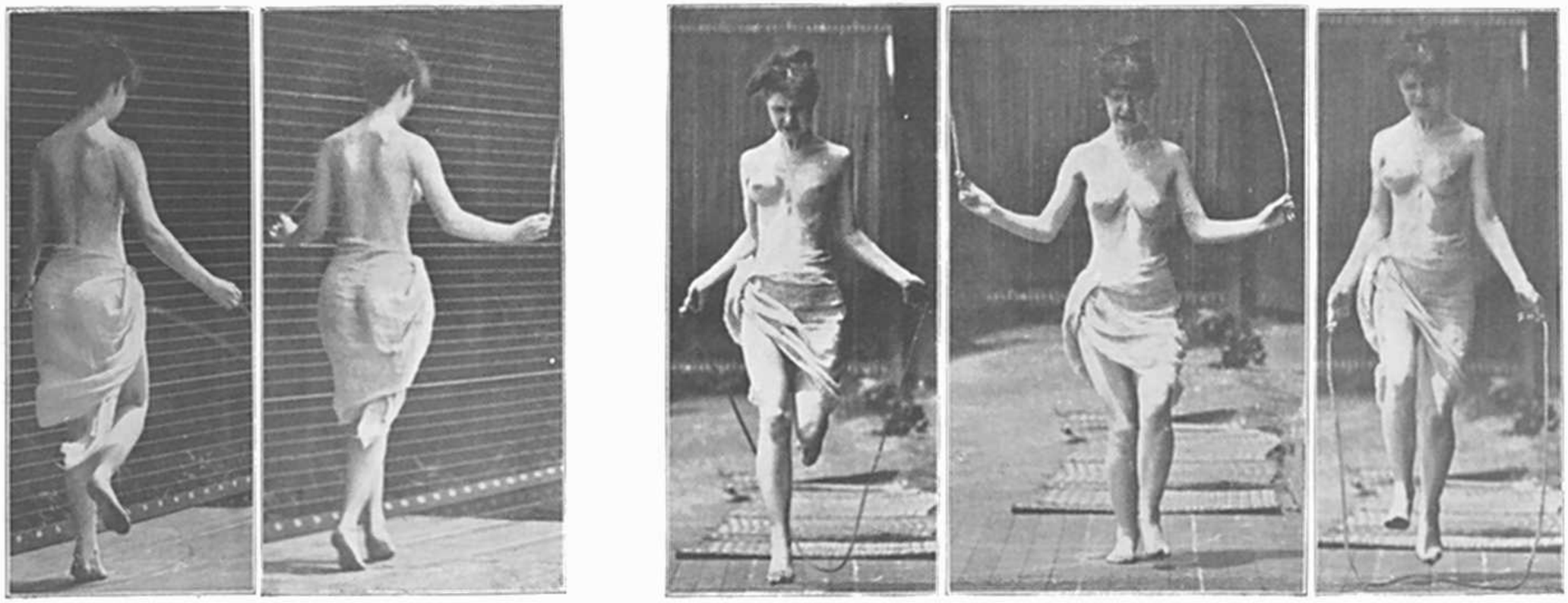
Copyright, 1887, by Eadweard Muybridge.]

VARIOUS ACTS OF MOTION.

Models 1 and 8.



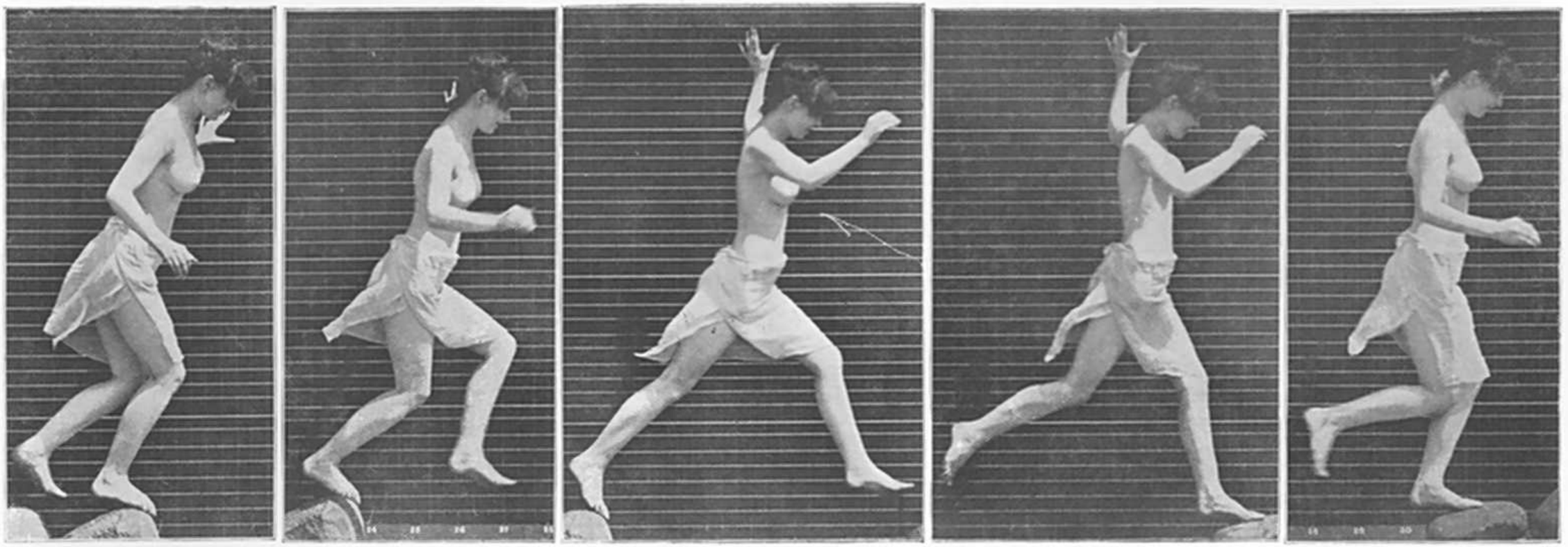
Copyright, 1887, by Eadweard Muybridge.]



Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 53.

Model 12.



Copyright, 1887, by Eadweard Muybridge.]

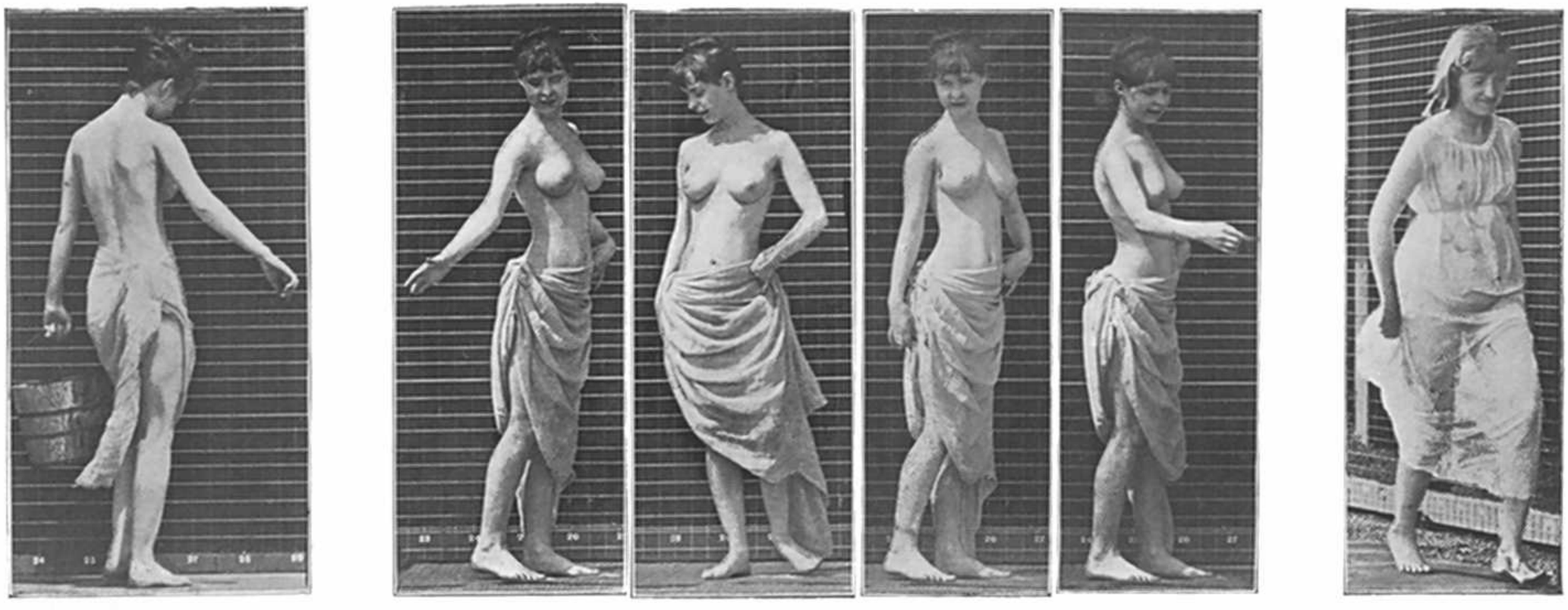
SELECTED PHASES FROM SERIES 54.

Model 12.

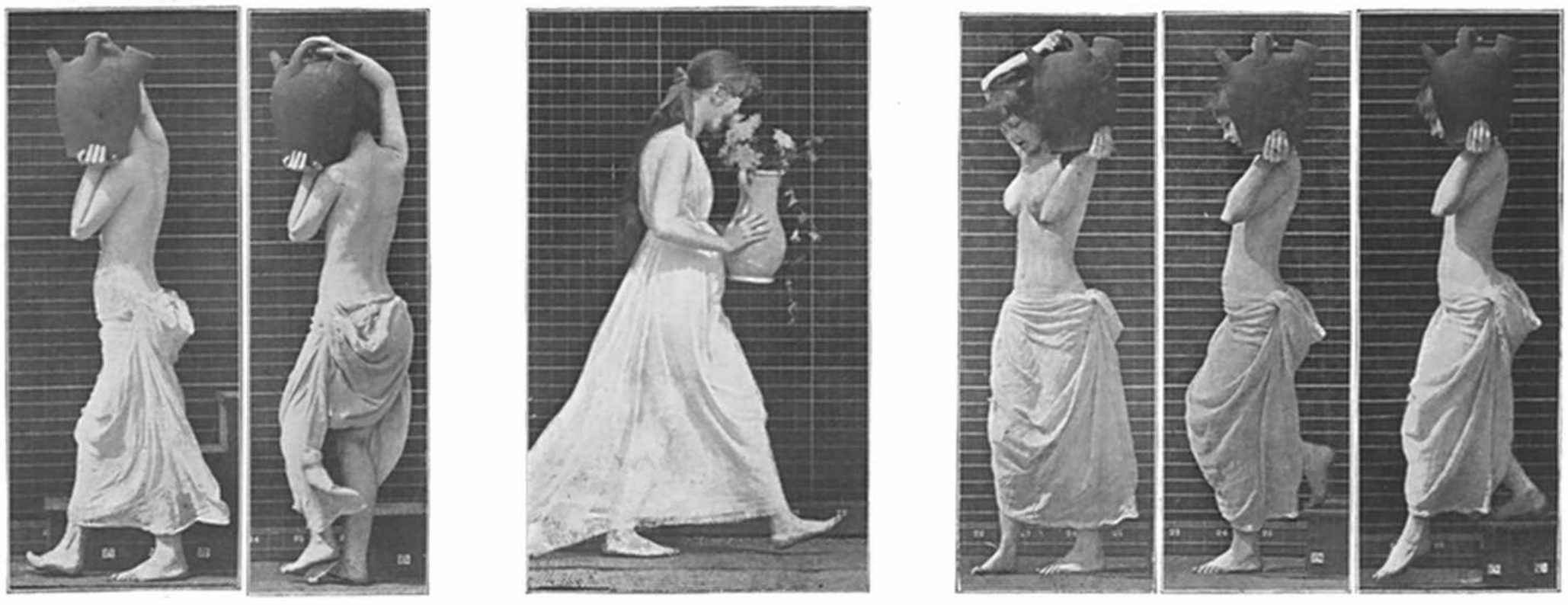
Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 55.

Model 12.



Copyright, 1887, by Eadweard Muybridge.]



Copyright, 1887, by Eadweard Muybridge.]

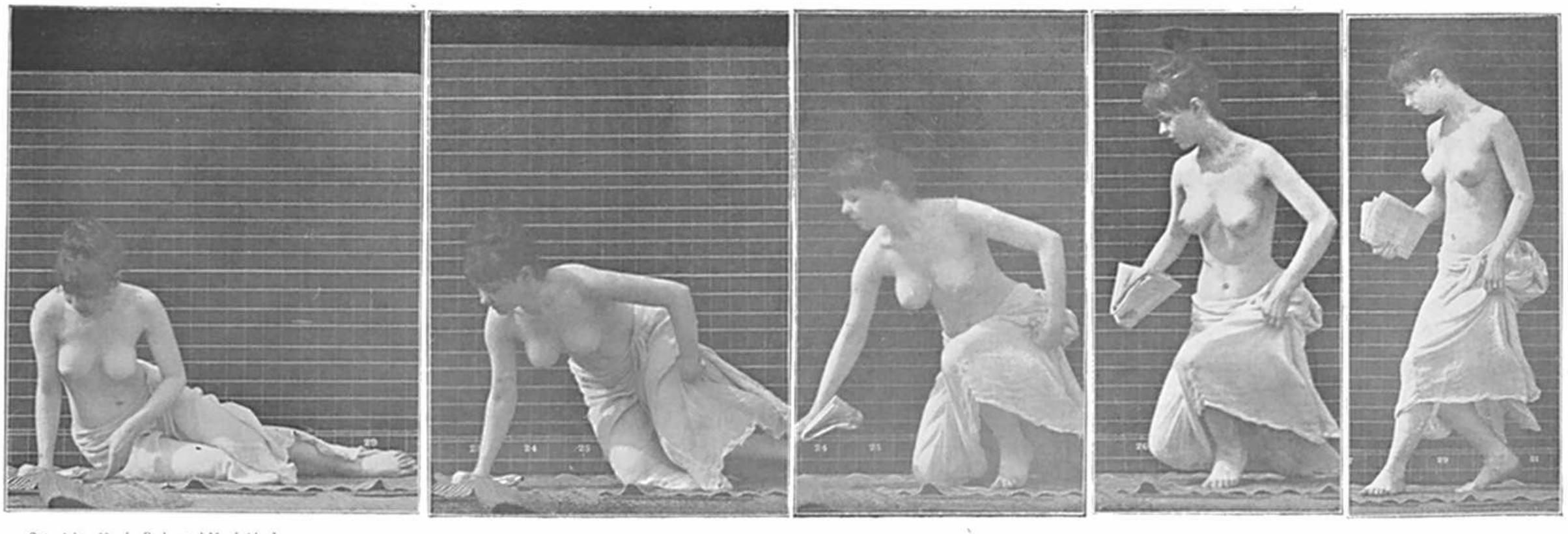
Models 7 and 12.

VARIOUS PHASES OF MOVEMENT.

Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 70.

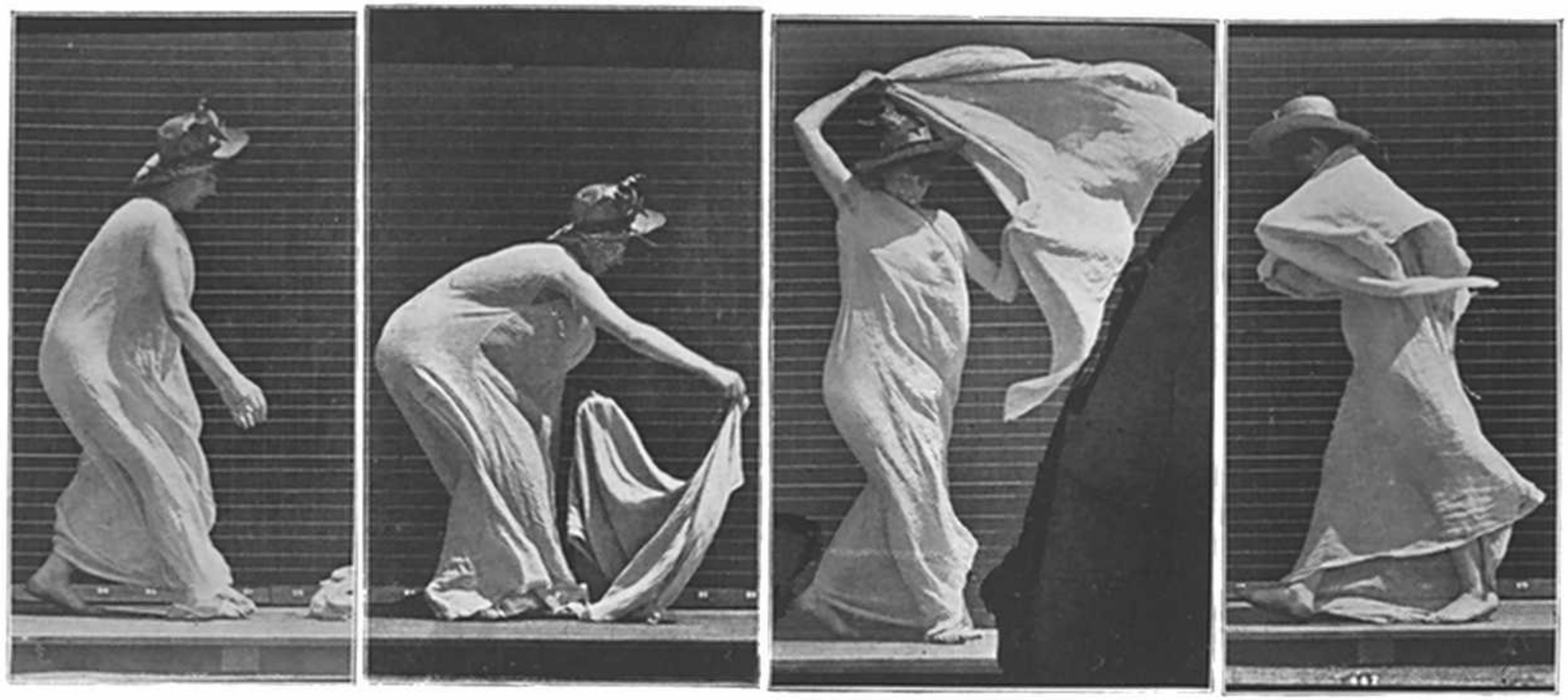
Model 12.



Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 56.

Model 12.



Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 61.

Model 8.

Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES.

Model 8.

See Series 67.

1

Copyright, 1887, by Eadweard Muybridge.]

2

3

4

Copyright, 1887, by Eadweard Muybridge.]

5

SELECTIONS FROM SERIATES 62, 63, AND 64.

EACH SELECTED PHASE IS ILLUSTRATED FROM ONE, TWO, OR THREE POINTS OF VIEW.

Model 12.

Copyright, 1887, by Eadweard Muybridge.]

6

7

9

Copyright, 1887, by Eadweard Muybridge.]

10

SELECTIONS FROM SERIATES 62, 63, AND 64.

EACH SELECTED PHASE IS ILLUSTRATED FROM ONE, TWO, OR THREE POINTS OF VIEW.

Model 12.

Copyright, 1887, by Eadweard Muybridge.]

Copyright, 1887, by Eadweard Muybridge.]

MISCELLANEOUS ACTS OF MOTION.

Models 4, 7, 12, and 15.

Copyright, 1887, by Eadweard Muybridge.]

See Series 66.

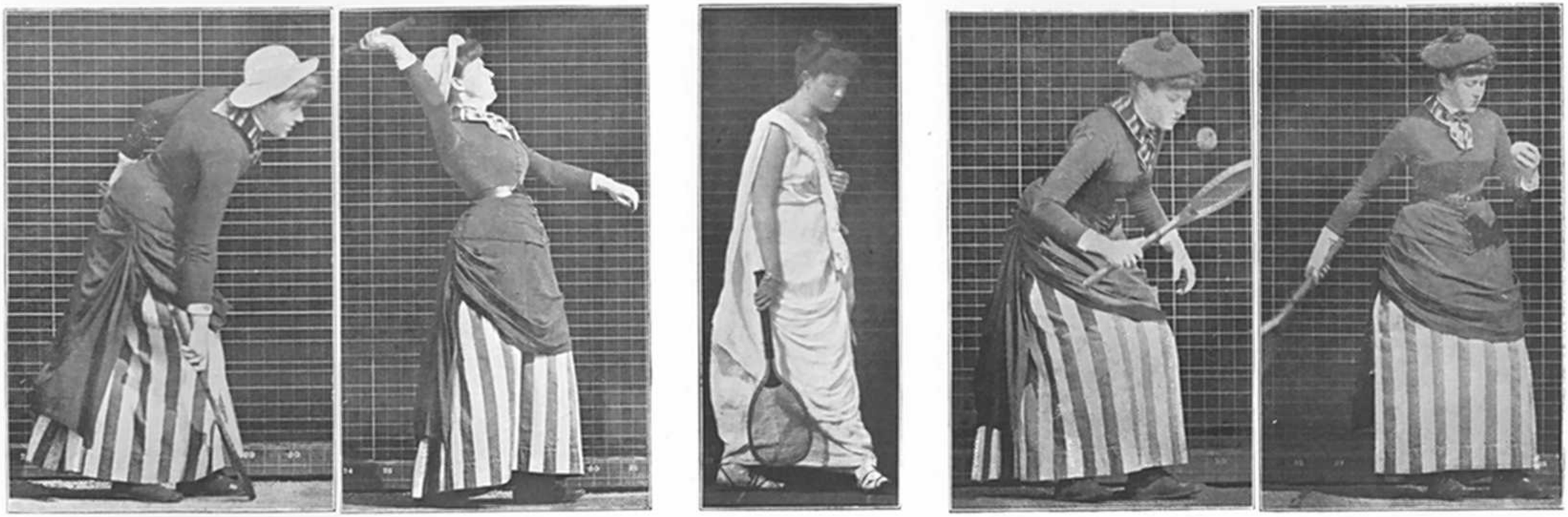
See Series 59.

See Series 71.

Copyright, 1887, by Eadweard Muybridge.]

Models 7, 8, and 15.

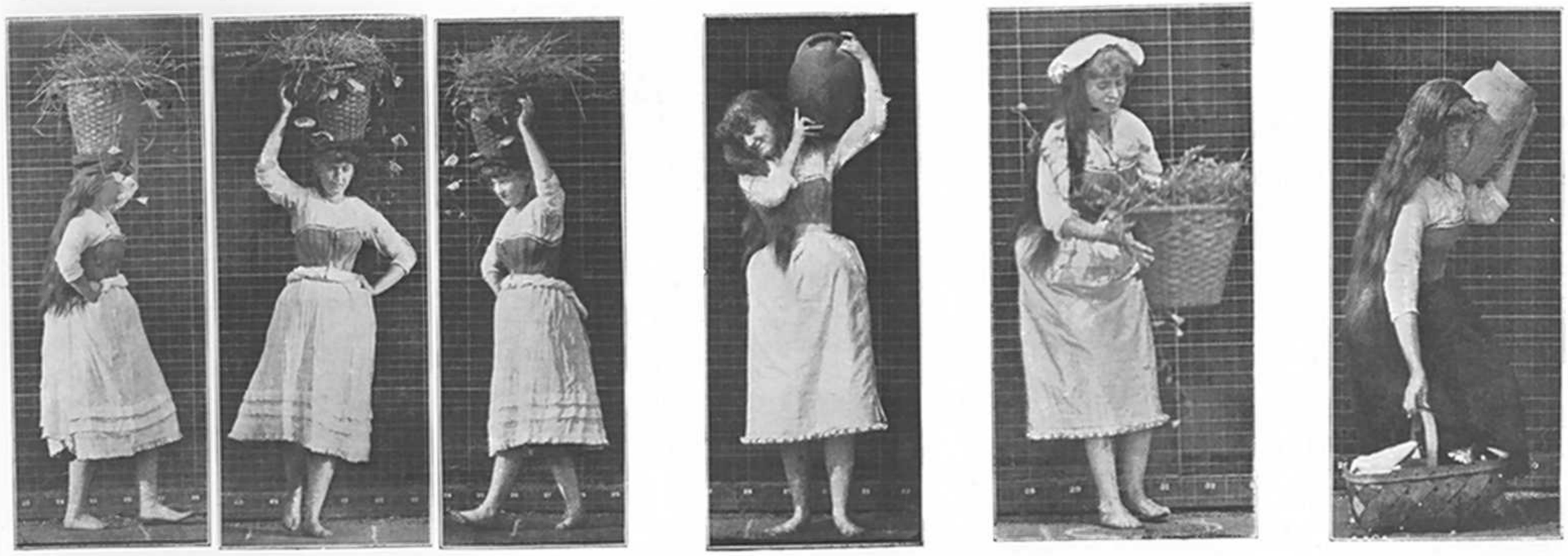
VARIOUS PHASES OF MOVEMENT.



Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES OCCURRING IN LAWN TENNIS.

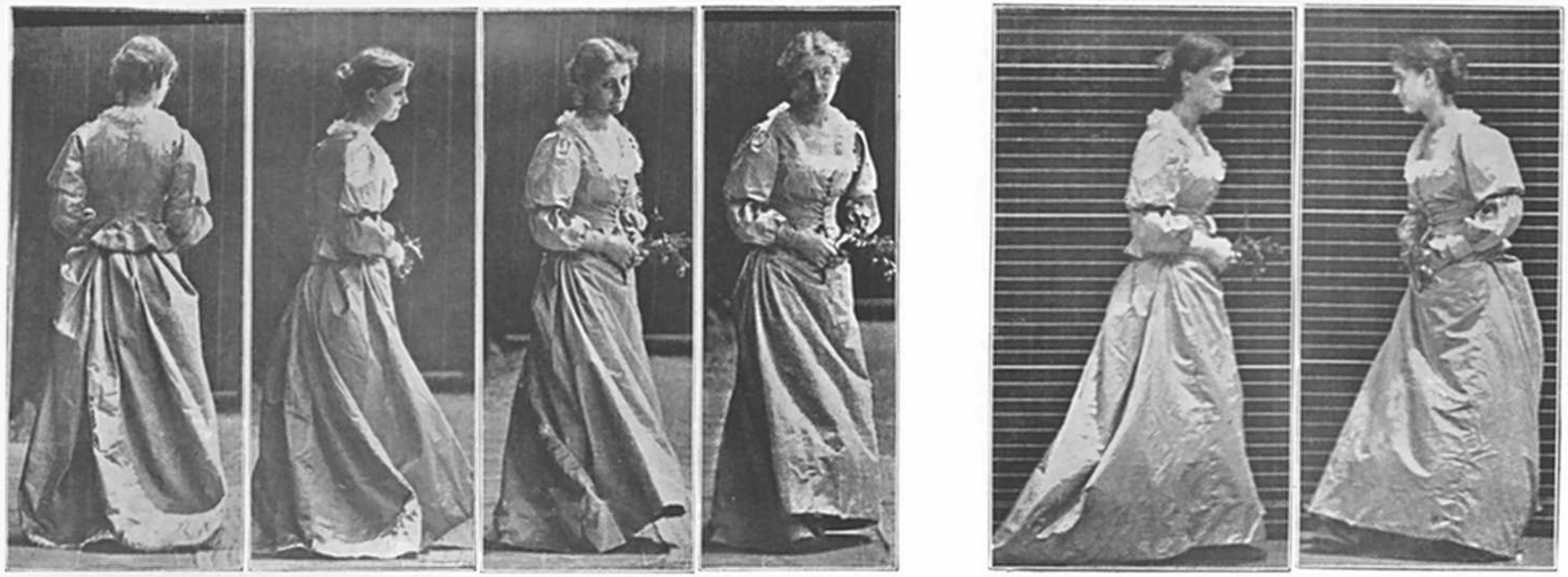
Model 15.



Copyright, 1887, by Eadweard Muybridge.]

VARIOUS PHASES OF MOVEMENT.

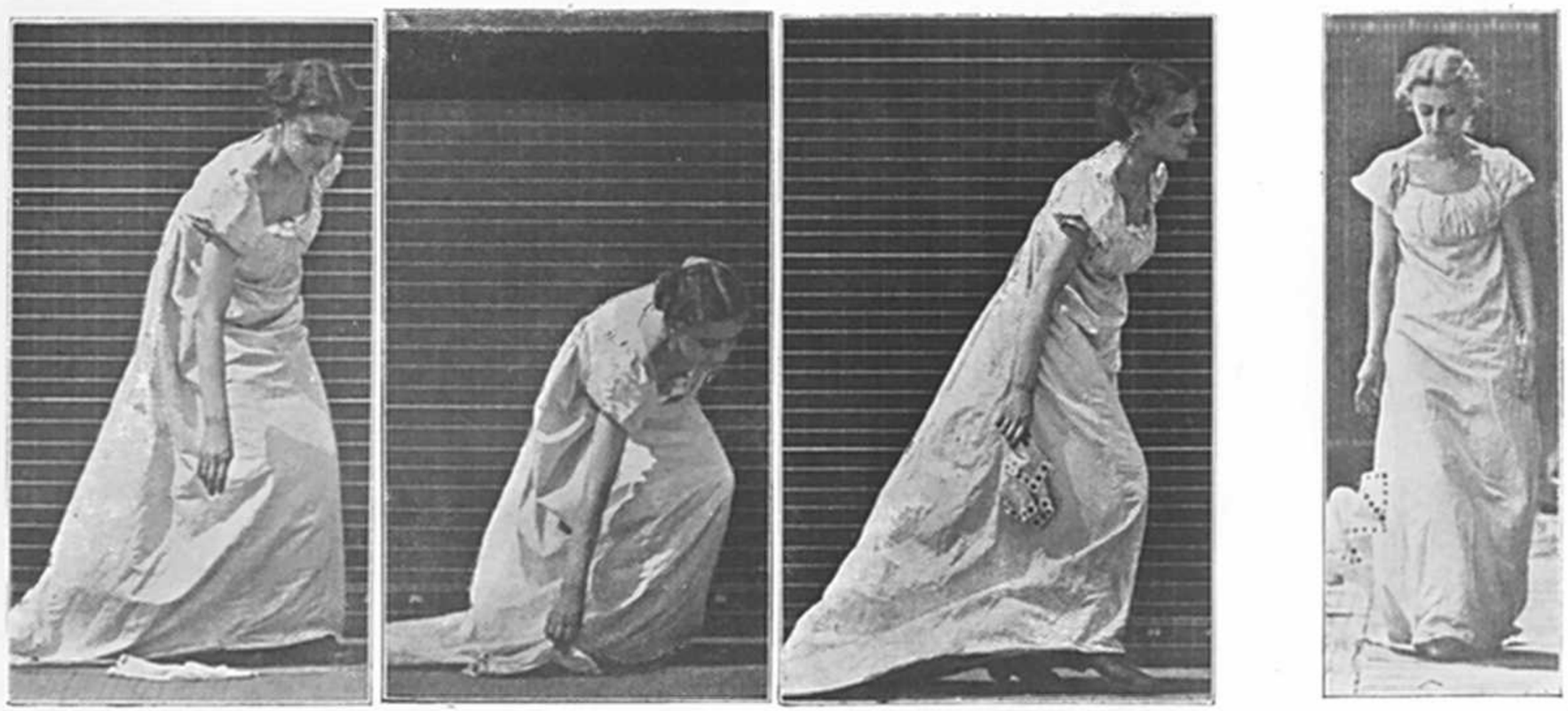
Model 7.



Copyright, 1887, by Eadweard Muybridge.]

SOME PHASES OCCURRING IN THE ACT OF TURNING AROUND.

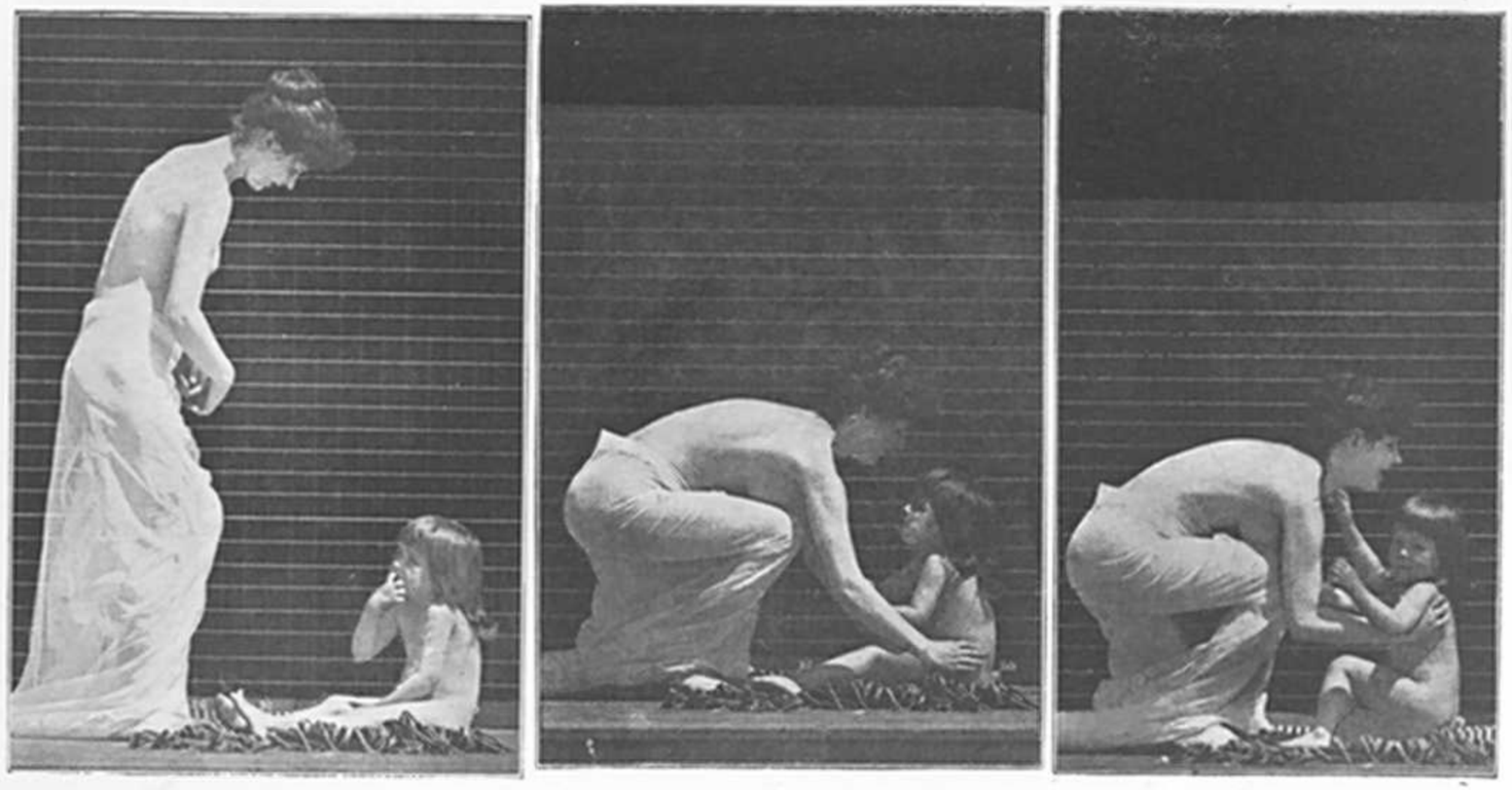
Model 5.



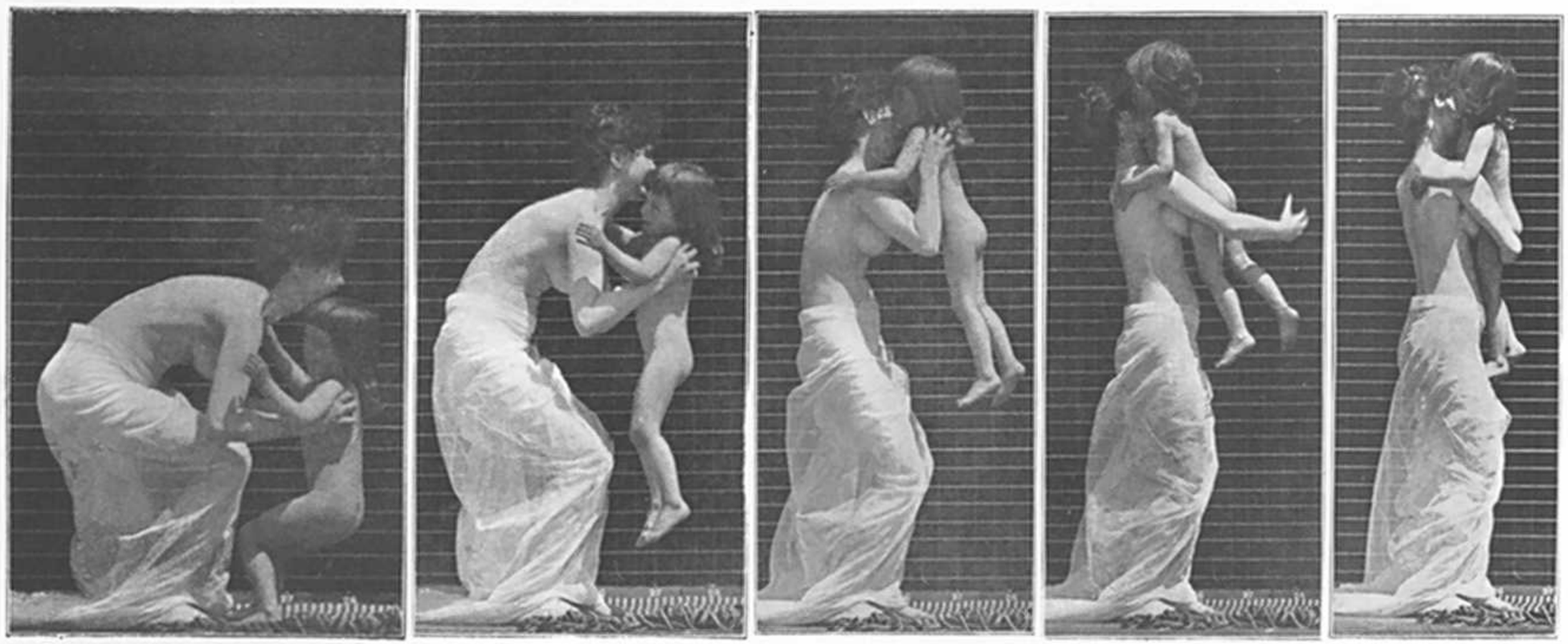
Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 75.

Model 5.



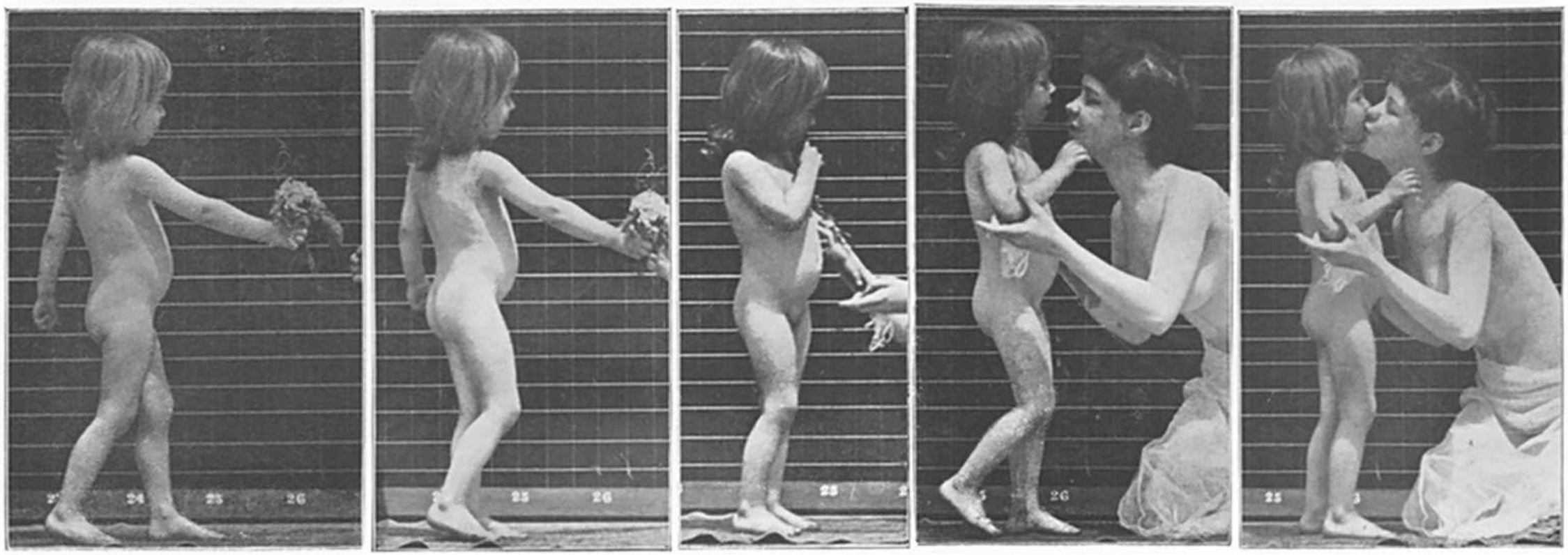
Copyright, 1887, by Eadweard Muybridge.]



Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 80.

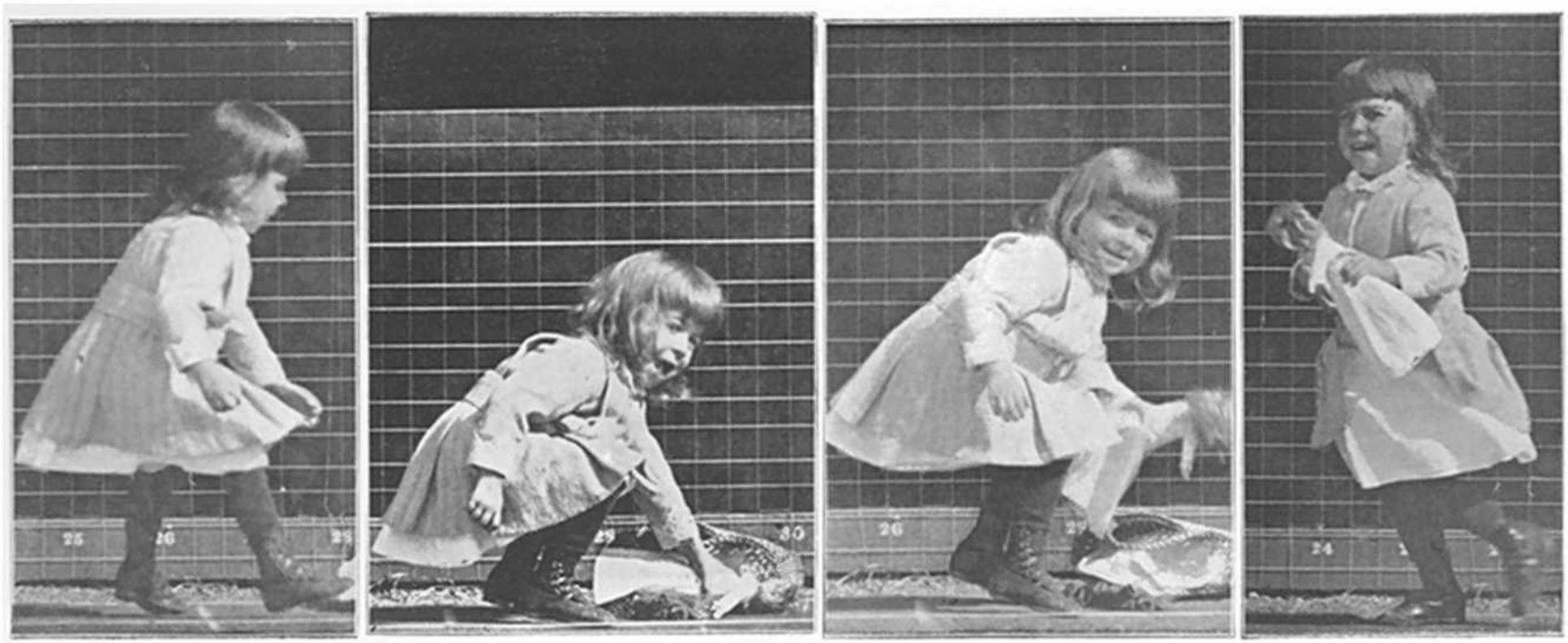
Models 12 and 70.



Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 79.

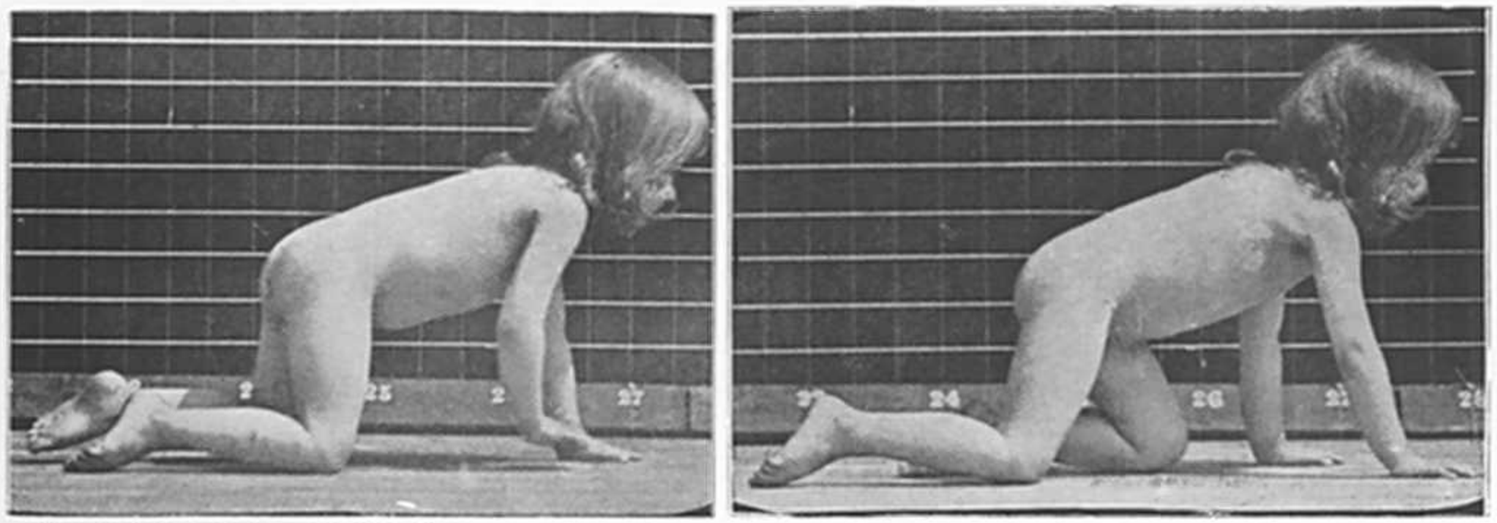
Models 12 and 70.



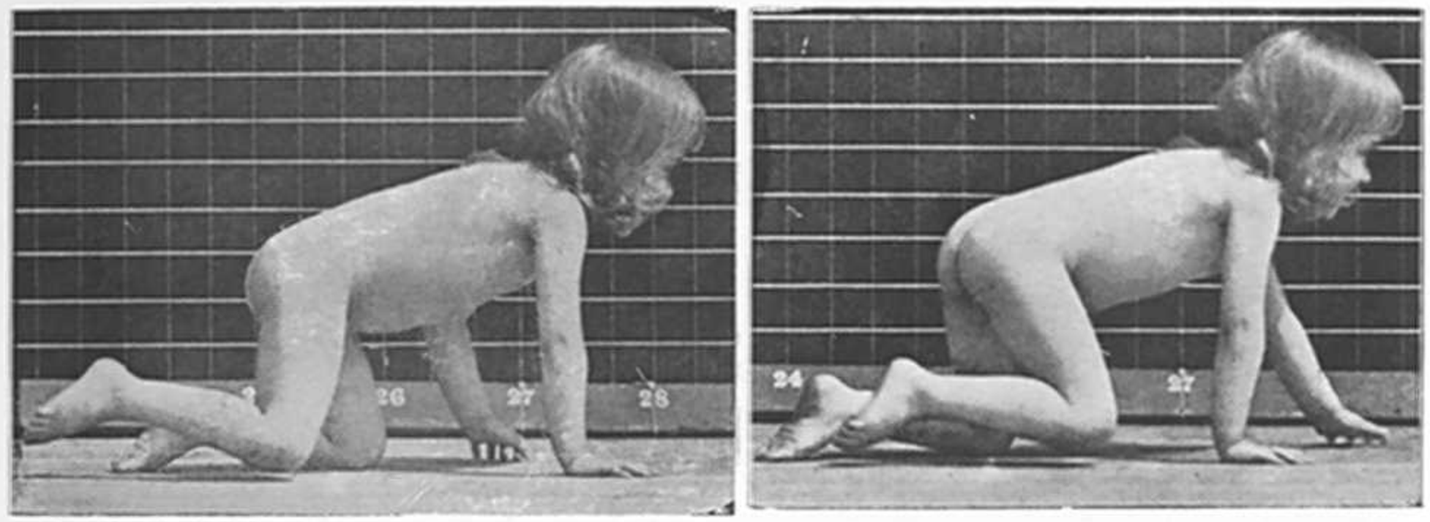
Copyright, 1887, by Eadweard Muybridge.]

PHASES OCCURRING IN THE ACT OF LIFTING A DOLL BY A CHILD.

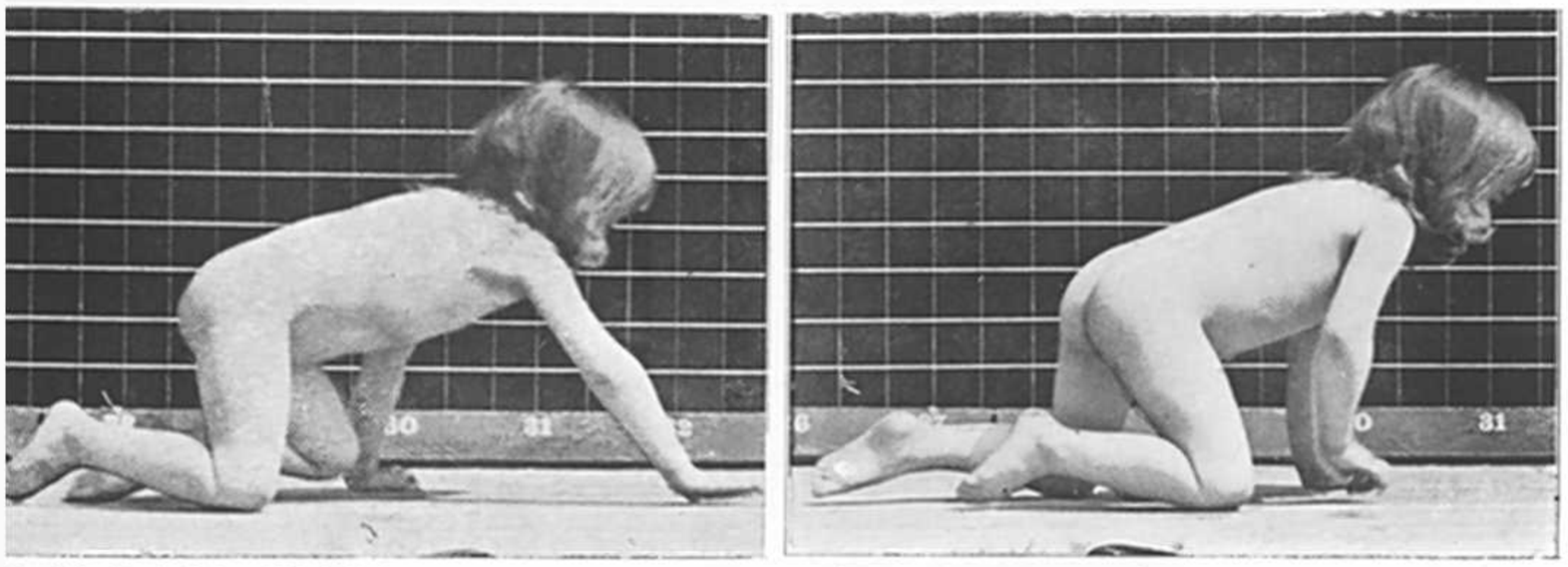
Model 70.



Copyright, 1887, by Eadweard Muybridge.]



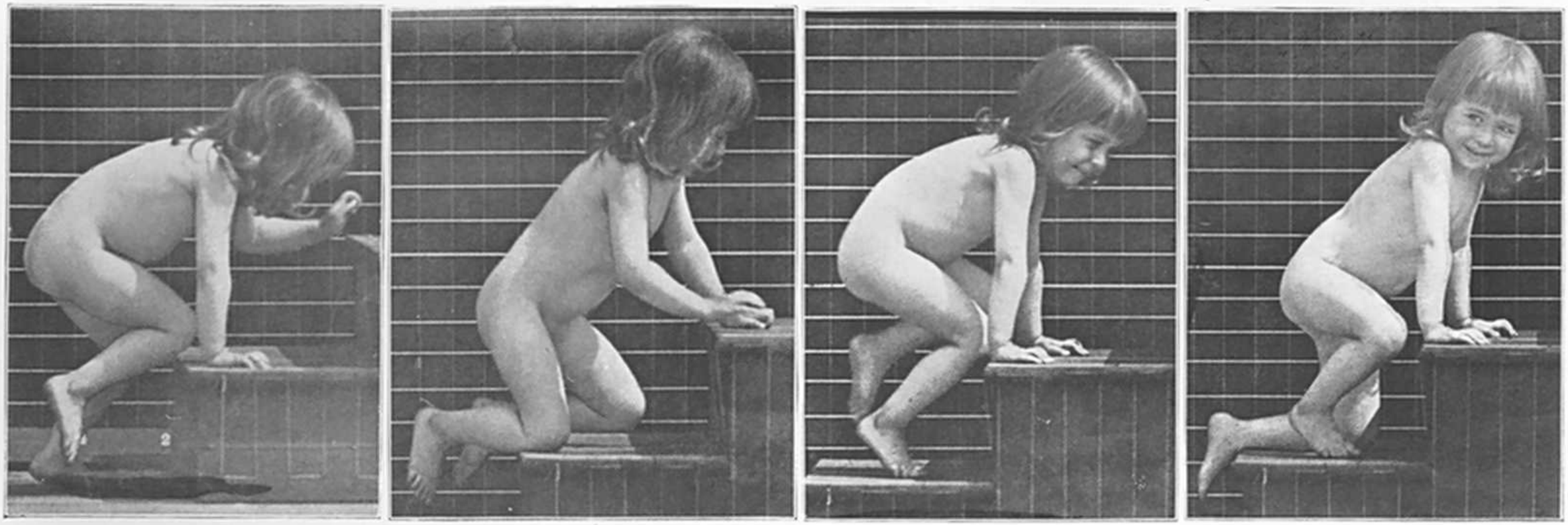
Copyright, 1887, by Eadweard Muybridge.]



Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 83.

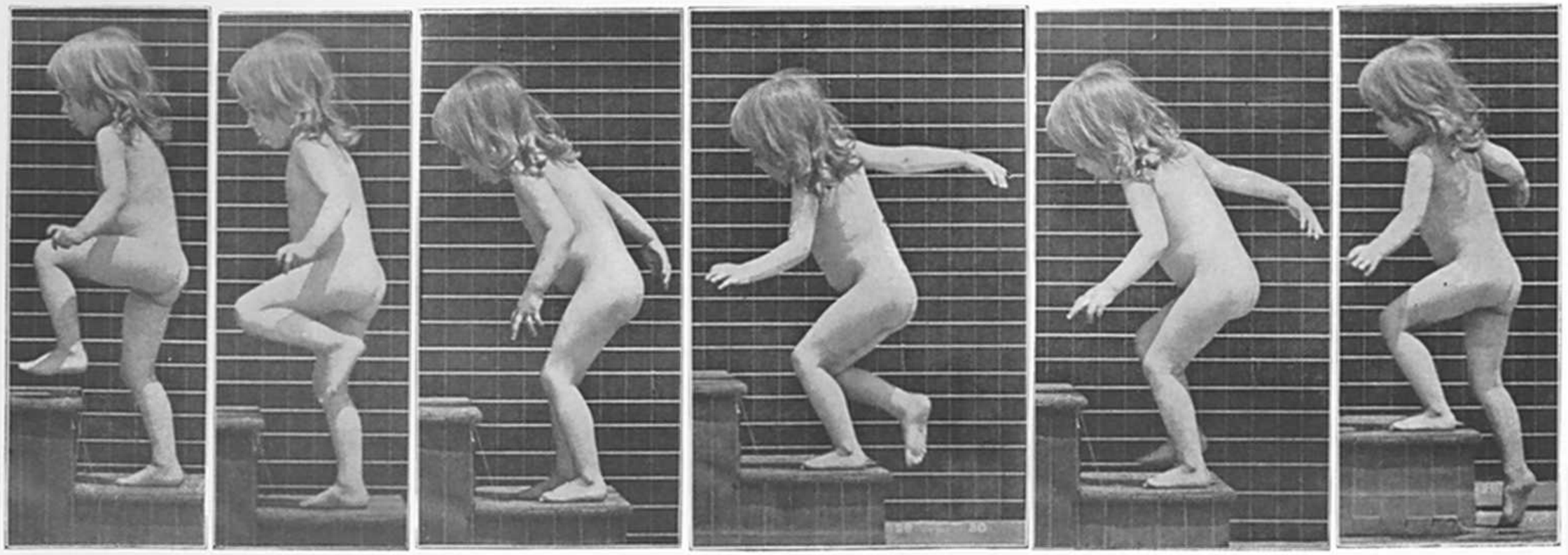
Model 70.



Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 86.

Model 70.



Copyright, 1887, by Eadweard Muybridge.]

SELECTED PHASES FROM SERIES 87.

Model 70.

APPENDIX A.

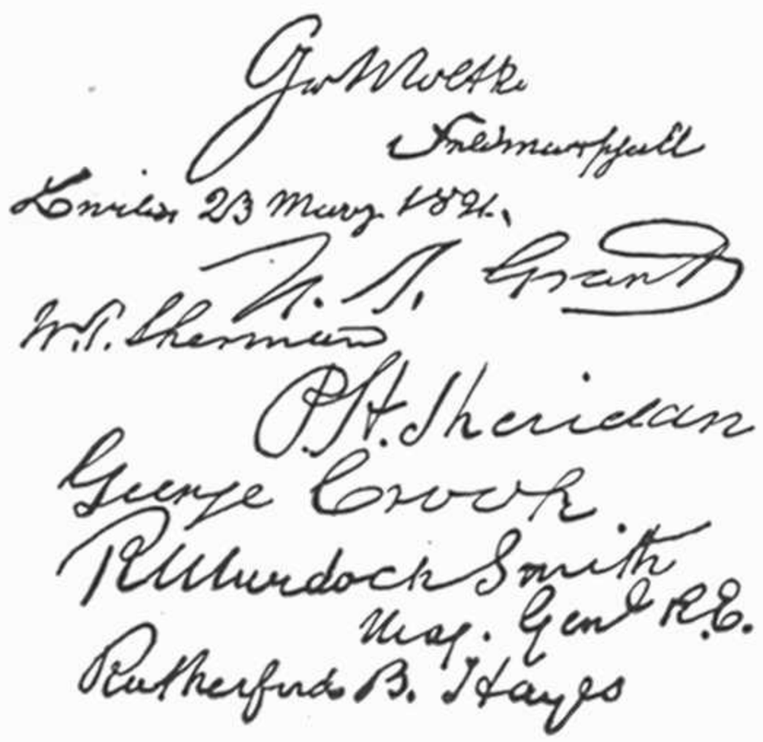
A FEW OF THE SUBSCRIBERS
TO
"ANIMAL LOCOMOTION."

BY

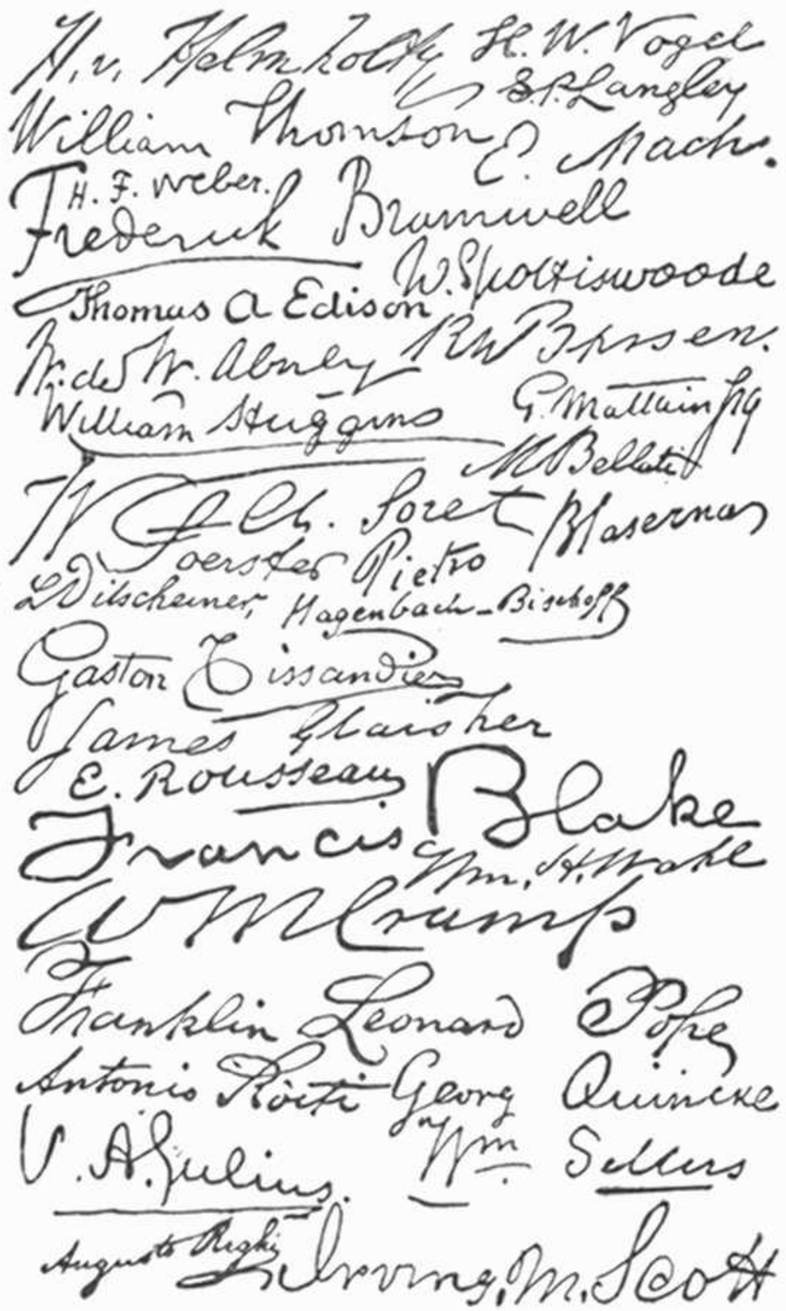
EADWEARD MUYBRIDGE.

THE ORIGINAL AUTOGRAPHS ARE ON THE SUBSCRIPTION BOOK IN THE POSSESSION OF THE AUTHOR, AND ARE, IN DIMENSIONS, ONE-FOURTH LARGER THAN THE FACSIMILE REPRODUCTIONS.

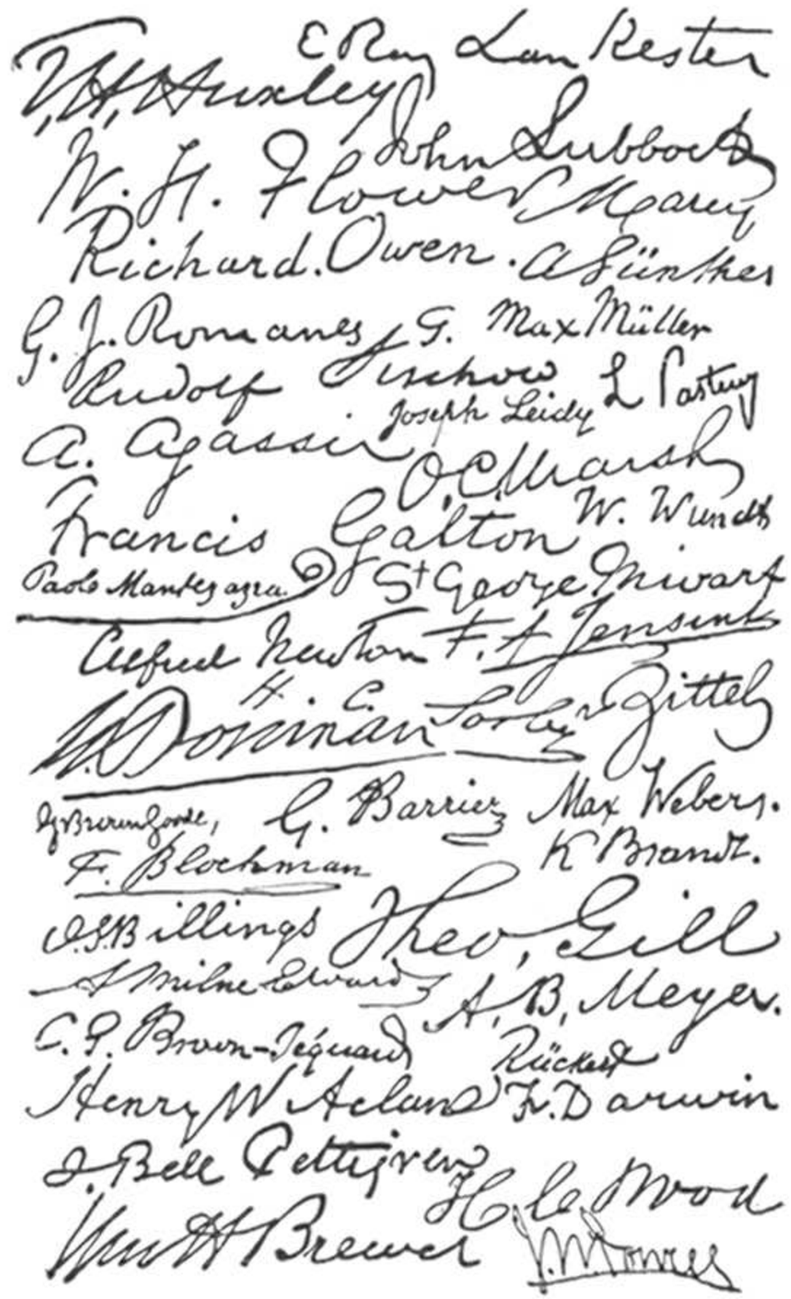
SCIENTISTS (MILITARY).



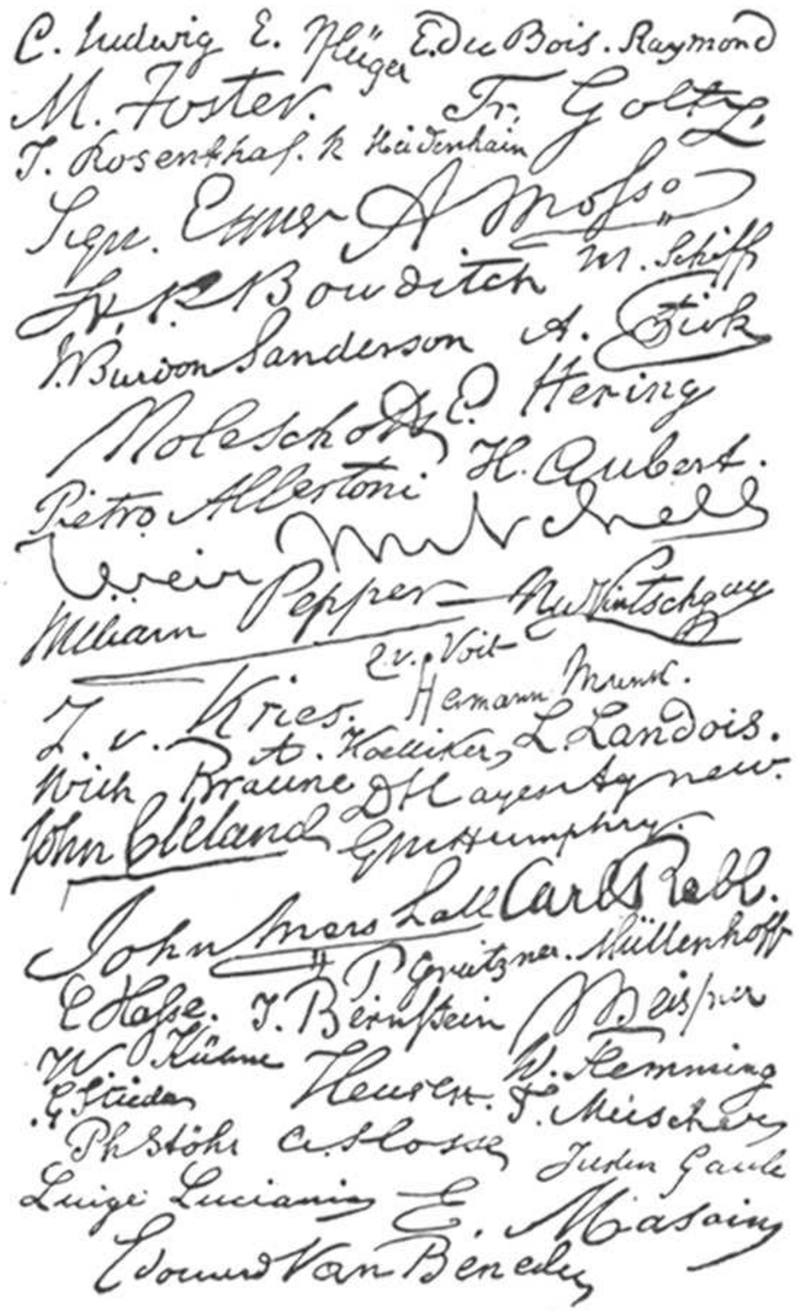
SCIENTISTS (PHYSICISTS, ETC.).



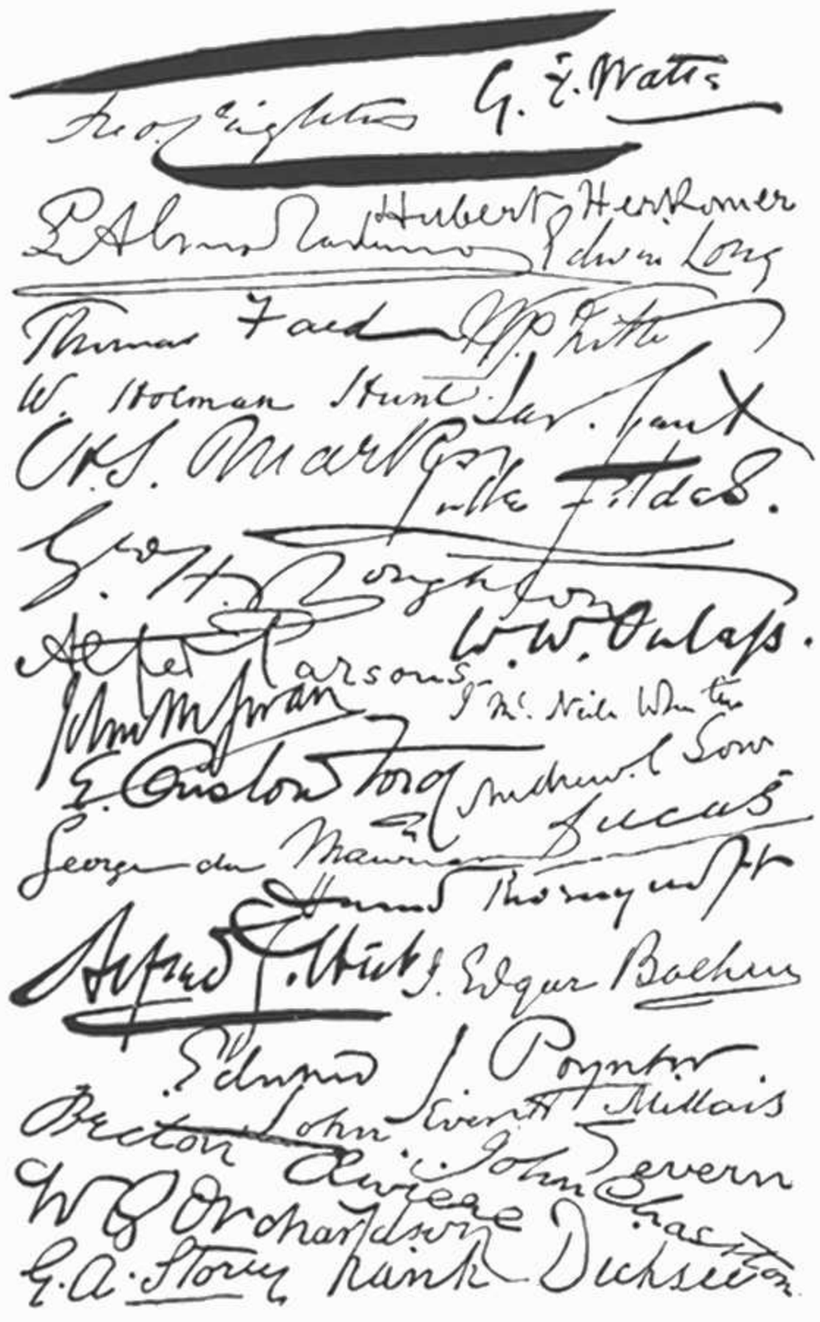
SCIENTISTS (BIOLOGISTS, PHYSIOLOGISTS, ANATOMISTS, ETC.).



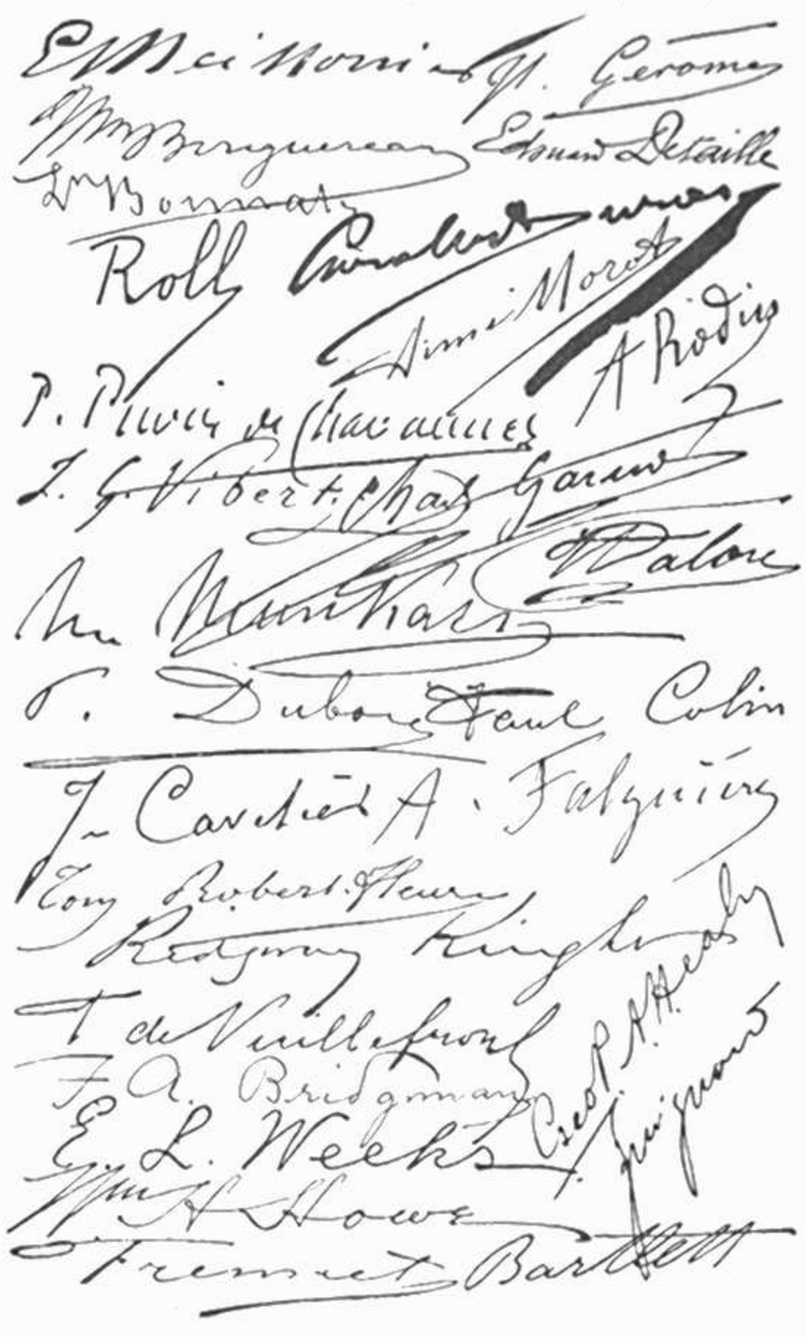
SCIENTISTS (BIOLOGISTS, PHYSIOLOGISTS, ANATOMISTS, ETC.).



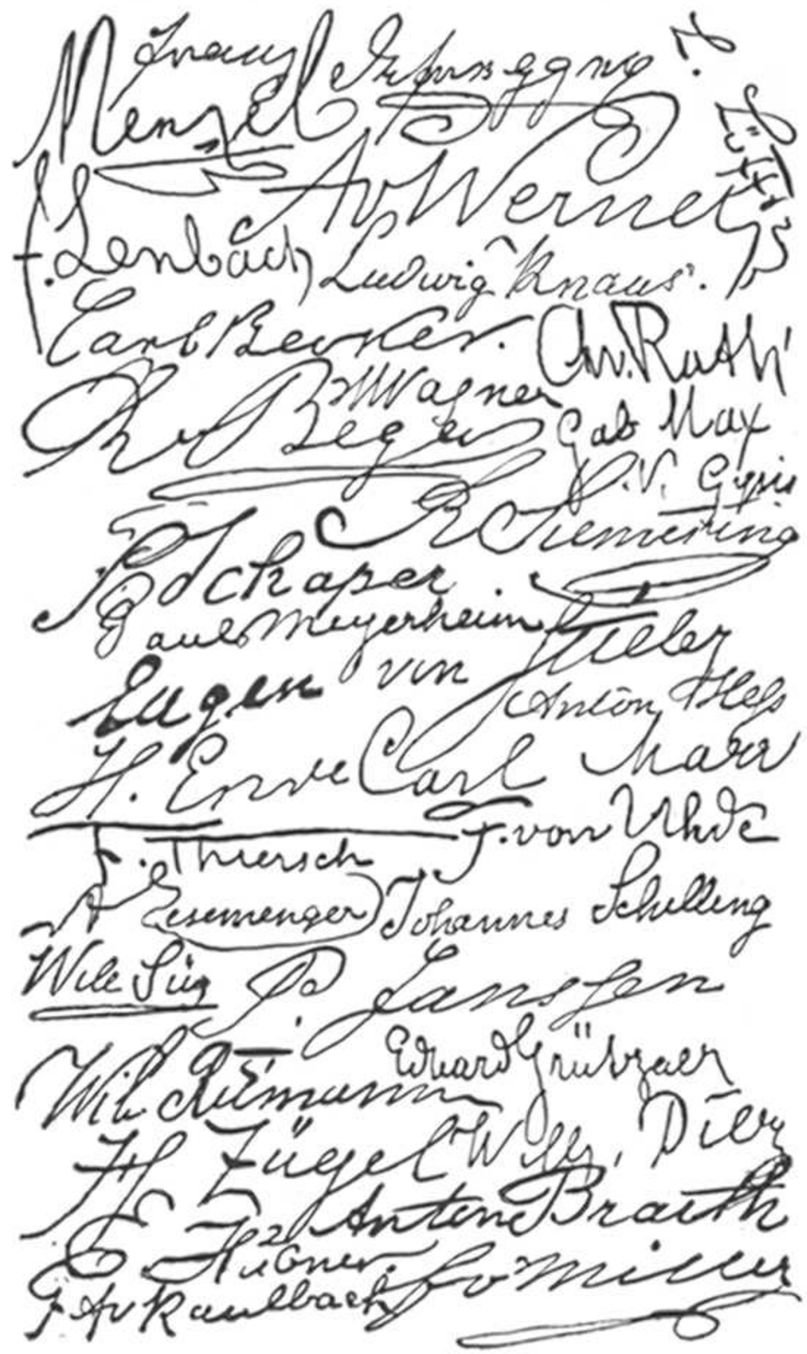
ARTISTS (PAINTERS, SCULPTORS, ETC.).



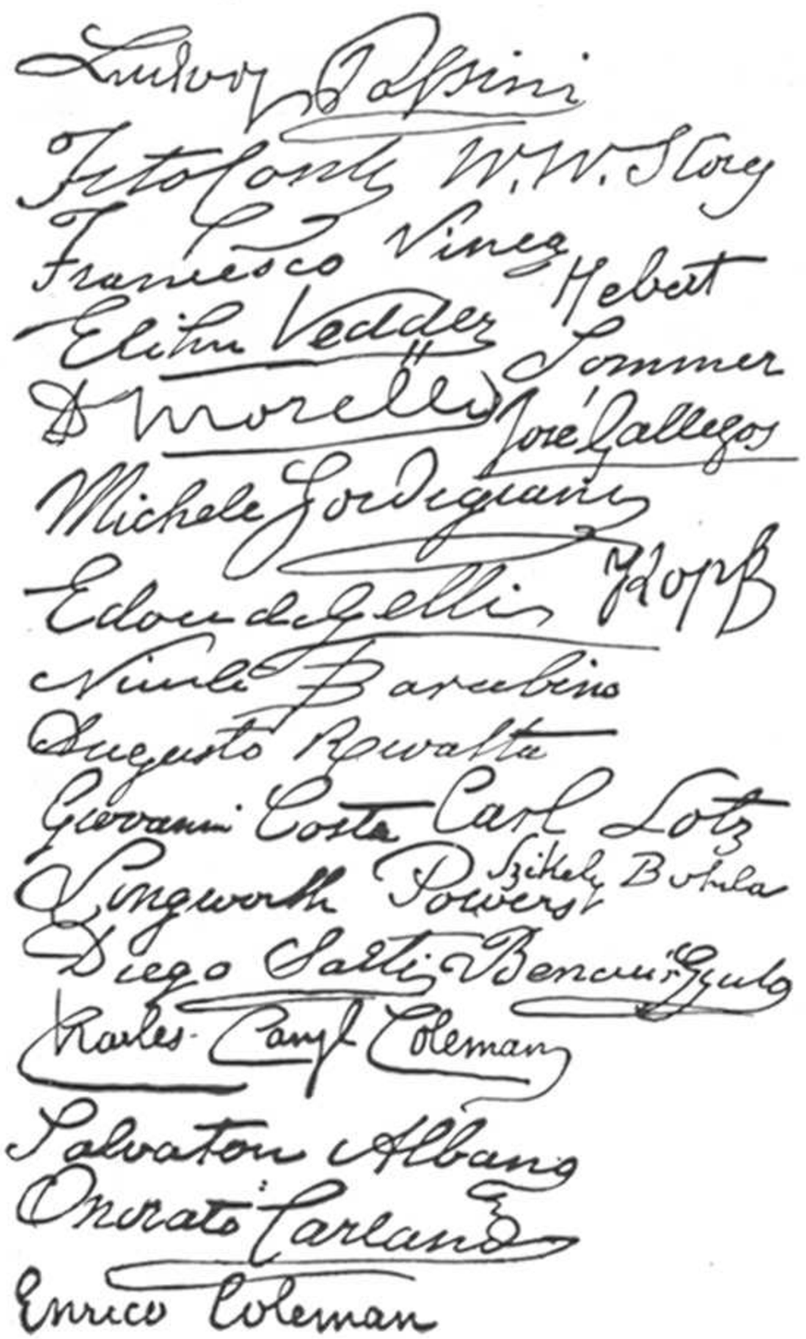
ARTISTS (PAINTERS, SCULPTORS, ETC.).



ARTISTS (PAINTERS, SCULPTORS, ETC.).



ARTISTS (PAINTERS, SCULPTORS, ETC.).



ARTISTS (PAINTERS, SCULPTORS, ETC.).

H. H. Richardson
J. L. Gerard
Sarah W. Whitman
Louis C. Tiffany
J. G. Brown
Laurt. Thompson
B. Uhle
Wm. T. Richards
Geo. St. Gaudens
Thos. Moran
Eastman Johnson
Anne Whitney
Ernest. W. Longfellow
Jos. Keppler
Geo. B. Post
Hamilton
R. Swain Gifford
Jno. La Farge
Thomas Allen
Morris
Elwood Perry Jr.
Edw. H. Kendall
F. D. Millet
D. H. Burnham.

AUTHORS OF WORKS ON ART.

John Ruskin
Albert Wolff
Joan Ruskin Severn
Chas. Waldstein
Otto Bennedorf
Wilh. Klein
Dr. Sambury
George Trumbull
H. E. von Berlepsch
Kekulé
Allen
A. Pearson
Henry Thode
Pulszky Karoly
Th. Schreiber
F. Dvorcek
John Evans.
Carl Mueller
Y. T. Graf
Hirschfeld
C. Müller
Ernst Ewald
G. Kinkel
J. Six
Nietzsche
Ludwig
Furness
Horace Howard
Furness
Fritz
Jaffé
Wm. J. Hamerton
Fred. A. Eaton.
H. Kühn
Adolf Michaelis
H. Blümner
Wm. Cliffe
George Duplessis,
W. Boyd
Leo Bullen
W. P. Garrison